

ERP IMPLEMENTATION AND ITS INFLUENCE ON FEW PARAMETERS OF ORGANIZATION STRUCTURE AND MANAGER'S JOB: AN EXPLORATORY CASE STUDY

A Thesis submitted

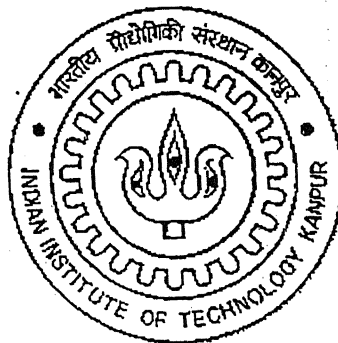
**In Partial Fulfillment of the Requirements
For the Degree of**

MASTER OF TECHNOLOGY

By

RAJESH CHAUDHARY

To the



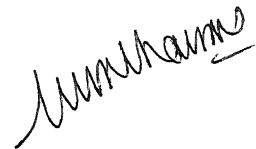
**DEPARTMENT OF INDUSTRIAL AND MANAGEMENT ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY**

KANPUR 208016

April, 2005

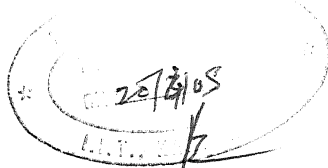
CERTIFICATE

This is to certify that the present work contained in the thesis entitled "*ERP Implementation and its influence on few parameters of Organization Structure and Manager's Job: An Exploratory Case Study*" has been carried out by Rajesh Chaudhary (Roll No. Y3114012) under my supervision & that this work has not been submitted elsewhere for degree.



Dr. R. R. K. Sharma
Head of Department,
Industrial & Management Engineering
Indian Institute of Technology, Kanpur

April 2005



TH
IME/2005/M
C 393e

19 JUL 2005/IME
मुख्यालय का. वि. वि. केंद्र पुस्तकालय
भारतीय प्रौद्योगिकी संस्थान कानपुर
बुकिंग नं. A...152168---



A152168

ABSTRACT

ERP (Enterprise Resource Planning) systems are used in the organizations for information integration and aligning & streamlining their processes for delivering high value to the customers. Through its very use, it influences jobs and the structure as well.

The objective of this thesis is to evaluate the impact of ERP on organizations, and examines the ways manager's job and organization structures have changed. We have investigated effect on five dimensions of Manager's job and five dimensions of organizational structure. We also study the impact of ERP on Flexibility. Based on ERP use in an organization we have presented results relating to changes.

We also suggest logical linkages between impact of ERP systems with certain organization structures and strategies chosen and present one hypothesis based on our finding, which may be verified by future study.

ACKNOWLEDGEMENT

I hereby extend my sincere gratitude and thanks to my guide and supervisor, Dr. R.R.K. Sharma. Without his consistent help and guidance it would have been difficult to accomplish this project.

I would like to convey my sincere gratitude to the management of M/s Tata Motors, for sustained support during the course my field work.

I am extremely thankful to all the respondents who participated in the survey and gave their valuable time and opinions.

Rajesh Chaudhary

CONTENTS

1.	Introduction	1
1.1	The Context	1
1.2	The Problem	1
1.3	The Study	1
1.4	Organization of the Thesis	2
2.	Literature Review	3
2.1	ERP Implementation chronologies	3
2.2	Pre-Implementation Phase	4
2.2.1	Effect of Pre-implementation attitudes of Employees	4
2.2.2	ERP system selection	6
2.2.3	Critical factors in Pre-implementation phase for a successful ERP system implementation	7
2.2.4	Pre-Implementation (planning) strategies	12
2.3	Implementation Phase	12
2.3.1	Implementation strategies:	12
2.4	Post-implementation Phase	14
2.5	A survey of implementation of ERP systems in Swedish manufacturing firms	14
2.6	A study of change in the Manager's job due to process change and ERP implementation with the focus on managerial roles and competencies – Doctoral thesis by Sanjay Kumar, IIT Kanpur, 2002.	15
2.7	Why ERP	18

2.8	What makes Factories Flexible	19
2.9	Dimensions of Organizational Structure	19
2.10	Functions of an Executive and roles of Managers	20
2.11	Effect of Computers on Organization Structure	21
2.12	Strategy types chosen by firm	21
3.	Plan of current work	23
4.	Data collection	25
5.	Data Analysis and Results	27
5.1	Reliability test for Scales	27
5.2	Use of Power	27
5.3	People Skills	28
5.4	Privileged Information	28
5.5	Delegation	28
5.6	Flexibility	29
5.7	Autonomy	29
5.8	Standardization	29
5.9	Specialization	29
5.10	Centralization	29

5.11	Formalization	---
5.12	Complexity Of Workflow	30
5.13	Implementation Work And Strategy Formulation Work of a Manager	30
6.	Discussion	32
7.	Conclusions and Directions for future work	35
	References	46
	Appendices	49
	Appendix 1 Questionnaire	49
	Appendix 2 Raw Data	58
	Appendix 3 Part of application given by organization to auditing agency	69

List of Tables

Table 1	Plant wise breakup of Respondents in various management levels	36
Table 2	Cronbach Alpha Values	36
Table 3	Results for Use of Power	37
Table 4	Results for Delegation	38
Table 5	Results for Autonomy	39
Table 6	Results for Specialization	40
Table 7	Results for Centralization	41
Table 8	Results for Formalization	42
Table 9	Results for Complexity of Workflow	43
Table 10	Results for People Skills	44
Table 11	Results for Privileged Information	44
Table 12	Results for Flexibility	44
Table 13	Results for Standardization	44
Table 14	Results for Implementation work and Strategy formulation work of a Manager - Question no. 1 & 2	45
Table 15	Results for Implementation work and Strategy formulation work of a Manager - Question no. 3 to 7	45
Table 16	Results for Implementation work and Strategy formulation work of a Manager - Question no. 8	45

CHAPTER 1

INTRODUCTION

1.1 The Context

Worldwide organizations are going for ERP (Enterprise Resource Planning) systems for information integration and aligning & streamlining their processes for delivering high value to the customers. ERP systems have their roots in MRP II systems. MRP II systems providing integration of few functional areas, has moved to the integration of whole organization and relaunched as ERP systems.

1.2 The Problem

Earlier researches in the field of ERP are mainly focussed on how to implement it successfully. There is no considerable research on what effect ERP has on the Organizations Structure and Managers job after implementation.

Researches in the field of effect of IT introduction and computerization in organizations are available which show ample evidence of changes in structure. Sanjay Kumar (2002), in his doctoral thesis has indicated change in Manager's job and competencies due to ERP implementation.

1.3 The Study

The present study is focused on the change in the Pre- and Post- implementation situation in the company under study at the level of the Manager's job and organizational structure. This study is conducted in a large automobile company of India which has completed approximately 6 years since the first 'roll out' of the ERP system. This is a multi-site company having production facilities at three locations.

The method used is survey with structure questionnaire of Senior, Middle, Junior level managers across all the locations. Responses from the questionnaires relating change are analyzed using t-test for difference in means of before and after ERP implementation. Besides this, company documents are obtained where required.

1.4 Organization Of the Thesis

This study is organized in 7 chapters. Brief of contents of these are given below:

Chapter 1 : It deals with the objectives of the study and outlines the overall methodology and organization of Thesis.

Chapter 2 : Literature survey focussing on ERP, IT and its effect on organizations, Manager's job, and Organizational structure is presented.

Chapter 3 : Plan for current work is presented in this chapter.

Chapter 4 : This chapter deals with the design of Data collection for the study.

Chapter 5 : Presents the results and analysis of the data collected through questionnaires.

Chapter 6 : Discussion of results and gives directions for the future work.

Chapter 7 : Conclusions of the study are presented in this study.

CHAPTER 2

LITERATURE REVIEW

In this thesis we are concerned about ERP Implementation and its effect on organization structure and manager's job. The literature in this area is doctoral thesis, Sanjay Kumar, 2002, IIT Kanpur. Most of the ERP literature is focused on ERP implementation and how to make it successful. Below we give a brief review of some of the literature on ERP implementation.

2.1 ERP Implementation chronologies

Herold et al. (1995) identified six phases of technology implementation. *Pre-adoption* is the stage at which organizations begin to consider the need to change technologies, identify technology options, and consider strategic directions. Once they have decided on an option, the result is an *adoption*. The adoption point marks the beginning of the *pre-implementation phase*. This involves such activities as planning for the technology introduction, deciding on the role of the vendor and in-house resources in managing the introduction, providing preliminary training, planning the logistics of the change, deciding whether a pilot study will be used, and deciding whether everything will be changed at once or whether a gradual phase-in will be used. If a *pilot study* is used, it represents a distinct stage in the process. In the pilot study stage, employees see the technology for the first time, talk to their colleagues about it, and form impressions of how things are likely to change in the future. The next stage is the actual *implementation*, which may take a long period of time, and identifying when it ends may be difficult. The *post-implementation* stage, or "routinization," represents a return to equilibrium the new technology has been implemented, it is being used, and people are reaching whatever accommodation to it that they are likely to reach. Over time employee attitudes likely converge on what Goodman and Griffith (1991) describe as a "normative consensus" or agreement about the use and value of the new technology.

2.2 Pre-Implementation Phase

2.2.1 Effect of Pre-implementation attitudes of Employees on implementing an Enterprise Resource Planning system

Employee attitudes toward ERP systems in the pre-implementation stage are important determinants of implementation behaviors and these can either hinder or facilitate implementation success. Specifically, the variables that shape attitudes towards an ERP system (capability, value, acceptance, and timing) in the pre-implementation stage are:

- Job tenure
- Job type
- Levels of involvement with the early implementation process

Sue Abdinnour-Helm', Mark L. Lengnick-Hall and Cynthia A. Lengnick-Hall, 2003, in their study in a large aircraft manufacturing organization in the Midwest, has presented the effect of these variables on attitudes towards ERP system.

Effect of Job Tenure: Job tenure is an important factor shaping attitudes toward the implementation of a new ERP system. Employees with less tenure (i.e., newer employees) are more optimistic about the potential capabilities and the potential value of the new ERP system than those employees who had been with the organization for longer periods of time. Employees with less tenure show greater acceptance of the new ERP system than employees ^{with} more tenure. Newer employees appear to be more receptive to new information technologies than those who have been employed by the firm for a longer period of time. Additionally, newer employees have not likely experienced previous management and IT initiatives, so they have not formed negative attitudes about their potential capabilities or value.

Effect of Job Type : Job type is also an influential factor in shaping attitudes towards ERP implementation. Managers appear to be significantly higher on the capability variable than production workers. Managers are significantly higher than supervisors, production workers and others on the value variable, but not significantly different from professionals/engineers on this variable. Managers are more positive than professionals/engineers, supervisors, production workers and others on acceptance of the new ERP system. Perhaps managers saw the new ERP system as both inevitable and likely to enhance their control over operations. As with job tenure, a normative consensus developed (Goodman and Griffith, 1991) across all job types that the timing of the implementation was not satisfactory.

Effect of levels of involvement with the early implementation process: Level of involvement in pre-implementation training appears to have little influence on attitudes toward ERP. Exposure to the ERP system and greater levels of involvement in its implementation does not seem to dramatically change the attitudes of employees. Across all levels of involvement, the capabilities and value and acceptance of the ERP system were rated more positively than the timing of the implementation.

How these attitudes in pre-implementation phase can play role in actual implementation of ERP system are presented below :

Organizational demography is an important factor determining attitudes toward ERP implementation and its ultimate effectiveness. Organizations with a higher proportion of relatively new employees may find it easier to implement ERP systems than organizations with a higher proportion of older employees who have higher levels of tenure. Firms with large proportions of long-tenured employees may need to find creative ways to ensure that employees attitudes developed through their experience with previous technology initiatives. Conversely, firms are likely to find it easier to convince their managerial and professional employees of the value and potential contributions of ERP to organizational effectiveness than to convince their operations level employees of these benefits. This suggests that firm which have a history of trust and collaboration across hierarchical levels are likely to experience a smoother implementation experience that

firms which have a tradition of adversarial relationships between managers/professionals and other employees.

An exceptionally quick implementation approach may not provide the time necessary for employees to learn about the system and appreciate its potential value. The consistent dissatisfaction with implementation timing across demographic and involvement segments may signal the need to give employees time to absorb the change as well as learn how the system works.

2.2.2 ERP system selection

Since an ERP system, by its very nature, will impose its own logic on a company strategy, organization, and culture, it is imperative that the ERP selection decision be conducted with great care. The greatest enterprise system implementation failures seem to occur when the new technology capabilities and needs are mismatched with the organization existing business processes and procedures. An organization should try to select and implement a system that underscores its unique competitive strengths, while helping to overcome competitive weaknesses. The ultimate goal should be to improve the business, not to implement software.

Elisabeth J. Umble, Ronald R. Haft and M. Michael, 2003 has recommended thirteen-step selection process which are summarized below.

1. *Create the vision.* Define the corporate mission, objectives, and strategy. Use cross-functional teams and executive-level input to identify, examine, and rethink existing business processes. This helps to ensure the necessary buy-in of both executive management and the process owners. Clearly define why the ERP system is to be implemented. If multiple plants are involved, the process must include participants from all plants.
2. *Create a feature/function list.* Identifying the features and functions required for the software to effectively support each functional area as well as the overall company vision.

3. *Create a software candidate list.*

4. *Narrow the field to four to six serious candidates.* This can be accomplished by a preliminary analysis of the strengths and weaknesses of each supplier and the "goodness of fit" of the software.

5. *Create the request for proposal (RFP).*

6. *Review the proposals.*

7. *Select two or three finalists.*

8. *Have the finalists demonstrate their packages.*

9. *Select the winner.* Based on cost, supplier support, ease of implementation, closeness of fit to the company business, flexibility when the company business changes, technological risk, and value (total implemented cost versus total value to the company).

10. *Justify the investment.* Based on the specific ERP software that has been selected, the potential tangible and intangible benefits of the implementation can be compared to the costs.

11. *Negotiate the contract.*

12. *Run a pre-implementation pilot.* The purpose of a pre-implementation pilot is to uncover major surprises, both good and bad, about the software as quickly as possible so as to facilitate the overall implementation.

13. *Validate the justification.*

2.2.3 Critical factors in Pre-implementation phase for a successful ERP system implementation:

Elisabeth J. Umble, Ronald R. Haft and M. Michael, 2003 examines the factors that, to a great extent, determine whether the implementation will be successful. The most prominent of these success factors are given below.

1. Clear understanding of strategic goals

ERP implementations require that key people throughout the organization create a clear, compelling vision of how the company should operate in order to satisfy customers, empower employees, and facilitate suppliers for the next three to five years. There must also be clear definitions of goals, expectations, and deliverables. Finally, the organization must carefully define why the ERP system is being implemented and what critical business needs the system will address.

2. Commitment by top management

Successful implementations require strong leadership, commitment, and participation by top. Since executive level input is critical when analyzing and rethinking existing business processes, the implementation project should have an executive management planning committee that is committed to enterprise integration, understands ERP, fully supports the costs, demands payback, and champions the project. Moreover, the project should be spearheaded by a highly-respected, executive-level project champion.

3. Excellent project management

A clear definition of project objectives and a clear plan will help the organization avoid the all-too-common "scope creep" which can strain the ERP budget, jeopardize project progress, and complicate the implementation. The project scope must be clearly defined at the outset of the project and should identify the modules selected for implementation as well as the affected business processes. If management decides to implement a standardized ERP package without major modifications, this will minimize the need to customize the basic ERP code. This, in turn, will reduce project complexity and help keep the implementation on schedule.

4. Organizational change management

The existing organizational structure and processes found in most companies are not compatible with the structure, tools, and types of information provided by ERP systems. Thus, implementing an ERP system may force the reengineering of key business processes and/or developing new business processes to support the organization goals. And redesigned processes require corresponding realignment in organizational control to sustain the effectiveness of the reengineering efforts. This realignment typically impacts most functional areas and many social systems within the organization. The resulting changes may significantly affect organizational structures, policies, processes, and employees.

Clearly, ERP implementations may trigger profound changes in corporate culture. If people are not properly prepared for the imminent changes, then denial, resistance, and chaos will be predictable consequences of the changes created by the implementation. However, if proper change management techniques are utilized, the company should be prepared to embrace the opportunities provided by the new ERP system and ERP will make available more information and make attainable more improvements than at first seemed possible. The organization must be flexible enough to take full advantage of these opportunities.

5. A great implementation team

ERP implementation teams should be composed of top-notch people who are chosen for their skills, past accomplishments, reputation, and flexibility. These people should be entrusted with critical decision making responsibility. Management should constantly communicate with the team, but should also enable empowered, rapid decision making.

The implementation team is important because it is responsible for creating the initial, detailed project plan or overall schedule for the entire project, assigning responsibilities for various activities and determining due dates. The team also makes sure that all necessary resources will be available as needed.

6. Data accuracy

Educating users on the importance of data accuracy and correct data entry procedures should be a top priority in an ERP implementation.

7. Extensive education and training

Education/training is probably the most widely recognized critical success factor, because user understanding and buy-in is essential. The full benefits of ERP cannot be realized until end users are using the new system properly. To make end user training successful, the training should start early, preferably well before the implementation begins. Top management must be fully committed to spend adequate money on education and end user training and incorporate it as part of the ERP budget. It has been suggested that reserving 15% of the total ERP implementation budget for training will give an organization an 80% chance of implementation success.

A designated individual (preferably the project leader) should maintain ongoing contact with all system users and monitor the use of, and problems with, the new system. There is also a need for post-implementation training. Periodic meetings of system users can help identify problems with the system and encourage the exchange of information gained through experience and increasing familiarity with the system.

8. Focused performance measures

Performance measures that assess the impact of the new system must be carefully constructed. But the measures must also be designed so as to encourage the desired behaviors by all functions and individuals. Such measures might include on-time deliveries, gross profit margin, customer order-to-ship time, inventory turns, vendor performance, etc.

Project evaluation measures must be included from the beginning. If system implementation is not tied to compensation, it will not be successful. Management, vendors, the implementation team, and the users must share a clear understanding of the

goal. If someone is unable to achieve agreed-upon objectives, they should either receive the needed assistance or be replaced. When teams reach their assigned goals, rewards should be presented in a very visible way. The project must be closely monitored until the implementation is completed. The system must be forever monitored and measured.

Management and other employees often assume that performance will begin to improve as soon as the ERP system becomes operational. Instead, because the new system is complex and difficult to master, organizations must be prepared for the possibility of an initial decline in productivity. As familiarity with the new system increases, improvements will occur. Thus, realistic expectations about performance and time frames must be clearly communicated.

9. Multi-site issues

The manner in which these concerns are addressed may play a large role in the ultimate success of the ERP implementation. The desired degree of individual site autonomy may be a critical issue which depends on two factors: (1) the degree of process and product consistency across the remote sites, and (2) the need or desire for centralized control over information, system setup, and usage. Another complexity in dealing with multi-site implementations is the degree to which the culture of the organization differs between sites. The fundamental issue here is one of corporate standardization versus local optimization. Corporate standardization brings with it simplified interfaces among diverse parts of the organization, ability to move people and products between sites with minimal disruption, and relative ease in consolidating data across the entire organization. On the other hand, local optimization may result in more effective and efficient operation and may reduce costs.

Perhaps the most difficult decision to be made in a multi-site implementation is the question of cutover strategy. The organization must choose between an approach where the implementation takes place simultaneously in all facilities or a phased approach by module, by product line, or by plant with a pilot implementation at one facility. With a large outlay of cash up front for software, hardware, and the project team, the company

may want a simultaneous implementation in order to recoup its investment as quickly as possible.

In a multi-site implementation, a phased approach is generally considered to be preferable. This is partly because the success or failure experienced in the first attempt at implementation often decides the fate of the entire project. Thus, the management team can gain momentum by selecting a pilot site that has a high likelihood of success. And if ERP is installed in a phased approach module-by-module, department-by-department, or plant-by-plant the lessons learned at early sites can make the implementations at later sites go smoother.

2.2.4 Pre-Implementation (planning) strategies:

Purnendu Mandal and A. Gunasekaran , 2003 in their paper has offered suggestions in resolving the issues of implementing ERP during Pre-implementation phase.

- Incorporate the risk and quality management plans in the change management plan.
- Breakdown the project into natural phases or subsystems for modular planning and for development of cross-functional communications.
- Consider a phase-based approach for gradual implementation rather than radical approach.
- Use appropriate planning styles for different tasks, detailed task plans for tangible tasks, iterative plans for evolving tasks, and personal communications plans for change management.
- Prepare plans for the recruitment, selection, and training of the necessary personnel for the project team.

2.3 Implementation Phase

2.3.1 Implementation strategies:

- Formulate a network for collecting user requirements and user feedback.
- Set-up monitoring and feedback network for collecting control information at each stage of the implementation process.
- Prepare to handle expected or unexpected crises and deviations from plans.
- Provide a strong leadership with concerns for the welfare of people and resource commitment.
- Provide a professionally stimulating work environment.
- Obtain top management support for the project and plan for an adequately resourced and proficiently executed launch.
- Promote client consultation and user participation and obtain approval from parties for what is being undertaken throughout the project.
- Use pro-active communications to establish more realistic expectations about the technology capabilities while communicating in tailored way to each division or unit.
- Promote collaborative system development between users and developers.
- Use multi-functional project teams to bring complementary capabilities together during the total life of the project.
- Familiarize the staff about the incoming technology and train the people involve with the system.
- Use intra-project teams and intra- and inter-industry networking for technology transfer.
- Provide stakeholders with a detailed plan of the implementation process, explain how it achieves business objectives, and keep them informed about the system and progress of its implementation.

- Propose possible ways for restructuring personnel and systems to accommodate the new technology including maximizing of system integration and interfacing.

2.4 Post-implementation Phase

Post-implementation activities are critical for the acceptance (adoption) of ERP systems. Requirements of IT systems and structures tend to change continuously even after the completion of a project. Post-project evaluation strategy could be followed in measuring the effectiveness of an ERP system, where questions such as listed below could be used for further improvement:

- whether the objectives of the ERP system were realized fully;
- whether the scheme options were considered adequately;
- whether the estimates and project information were accurate;
- whether or not the agreed practices and techniques were complied with;
- any other factors which are considered appropriate.

Such evaluations could concentrate on, firstly, cost estimates against actuals and reasons for variations. Secondly, the evaluation could suggest any possible improvements to the IT system. Thirdly, the degree of staff consultation could be assessed and improvements suggested. Finally, post-implementation evaluation can suggest improved procedures in avoiding failure in future similar projects in the organization.

2.5 A survey of implementation of ERP systems in Swedish manufacturing firms

Jan and Erik Selldin, 2003 in his paper presents results of a survey of implementation of ERP systems in Swedish manufacturing firms. The survey was done with PLAN members employed within manufacturing firms in Sweden. The questionnaire focuses on six areas: characteristics of the firm and the respondent including ERP system penetration, pre-implementation process, ERP system

configuration, implementation experience, benefits observed, and future directions planned. With a response rate of 37.2% of the contacted companies, this survey is able to provide a fairly accurate overview the status of ERP system implementation issues.

Some interesting findings are summarized below.

First, Swedish manufacturing firms are broadly adopting ERP systems; 83.6% have implemented such systems or are in the process of implementing. Second, the cost for implementing ERP systems range from an average of 0.5% of annual revenues for large enterprises up to an average of 3.5% for smaller companies. Thus, the ERP system cannot be considered to be an overwhelming investment for the enterprise. Third, Swedish firms often choose to implement ERP systems from Swedish vendors. Fourth, the modules that are implemented tend to be the core production management modules involved in the customer order process; these modules are also the modules requiring the most customization. Financial accounting and control come next as the most implemented modules. Thus, ERP systems primarily support the material and information flows and secondarily the financial flows. Fifth, the most cited improvements related to ERP systems are concerned with information access and improved intra-organizational interaction. Sixth, given that the ERP penetration is high, most Swedish companies plan to extend their ERP systems with functional support for upstream and downstream supply chain operations.

2.6 A study of change in the Manager's job due to process change and ERP implantation with the focus on managerial roles and competencies – Doctoral thesis by Sanjay Kumar, IIT Kanpur, 2002.

This work is concerned with the change in the manager's job due to the implementation of BPR (Business process reengineering) and ERP (Enterprise Resource Planning) systems, i.e., how these have effected the role profile of the manager's job,

which roles are affected most, how is the managerial competency profile affected, and which competencies are affected most?

The following questions were also examined: does the implementation of process change prior to the implementation of an ERP system, lead to higher benefits being perceived by the incumbents? And does prior I.S. experience, lead to qualitatively different changes in the organization, due to the implementation of ERP systems.

Adopting an 'engineering' approach the 'manager's job' was defined as comprising a set of tasks which were performed by the manager. Tasks of a similar nature were clubbed together as roles and the change in these roles was studied, to obtain an estimate of the incidence and direction of the change in the manager's job. Similarly the managerial competency groups were defined in terms of representative tasks and the change in these tasks was studied to obtain an estimate of the change in these managerial competencies.

In the post ERP / BPR implementation scenario the following changes were observed:

1. Role profile had changed significantly across plants and functions with the importance of Monitor, Director, Producer and Innovator roles increasing.
2. Overall competency profile had changed significantly across functions and hierarchical levels, with the importance of Proactive Orientation, Achievement Orientation and Leadership groups increasing.
3. The change (benefit) perceived in task oriented roles, namely, Monitor, Coordinator, Director and Producer roles, is significantly more as compared to the interpersonal oriented roles like Mentor, Facilitator. Innovator and Broker.
4. The change (benefit) perceived in task oriented competency groups namely Proactive Orientation, Achievement Orientation and Leadership is more as compared to

interpersonal oriented competency groups like Human resource Management, Directing Subordinates and Focus on Others.

5. Factor analysis led to the regrouping of the tasks, in to the following new roles and competency groups.

Roles: Leading Inside, Problem Solving, Introducing and Managing Change

Competency Groups: Motivational leadership, Action Management, Networking management and Problem Solving.

The following major constructs were identified to be the drivers behind the observed changes: (a) Work related dependencies of the job, (b) dominant organizational control system and (c) the mechanisms employed for reducing the information processing requirements of the organization, or increasing the information processing capacity of the organization.

Following are some more observations related to the research questions:

1. Organizational information processing capacity considerations reveal some (of the total range) of process changes which may be implemented synergistically a long with ERP implementation.
2. Prior experience with an information system of a similar nature leads to a qualitatively superior implementation of the ERP system with the following differences: (a) more of the functionality of the software activated and utilized (b) information system related practices show more efficient data capture, generation, management and utilization of information (c) relevant and practical rules are built into the software.

2.7 Why ERP:

Here salient points of the reference book “WHY ERP? A Premier on SAP Implementation” by F. Robert Jacobs & D. Clay Whybark are presented.

- ERP leads to information integration for the various functions of the business like Accounts, Finance, Marketing, Sales, Production, Vendors, and Distribution etc. It provides the benefit of single data entry, immediate access, and common data. Data are updated in real time, meaning that when data is entered into the system, the changes are immediately available to everyone.
- Prevailing Business processes are replaced by best practices.
- Organizations with multi-plants located all around the globe are benefited most.
- If information is available quickly and accurately, then resources are put to better and can be efficiently used.
- ERP implementation is not an easy task. There are horror stories of implementation failures. It assumes all people problems are solved and people cooperate. But the roles of some people change significantly due to ERP. This thing bring resistance and wrong aptitude building in minds of employees which needs to be tackles appropriately.
- Do not implement everything on ERP, most critical areas where information integration is essential, could be put on ERP.
- Matrix for relationship of centralization & flexibility with Architecture of ERP Package:

Flexibility	High	Common Client Multiple Processes	Multiple Client Multiple Processes
	Low	Common Client "Best Practices"	Multiple Client Mostly "Best Practices"
		High	Low
		Centralization	

2.8 What makes Factories Flexible

Upton, David, M. in his paper “ What really makes factories flexible “ argues that CIMS makes factories flexible. New requirements come up each time and software is really not equipped to handle such requirements making it inflexible.

2.9 Dimensions of Organizational Structure

Pugh et. al., 1968 describes five dimensions of Organizational structure –

- **Centralization:** Centralization in an organization denotes the locus of authority to make decisions affecting the organization. It is concerned with the lowest level in the hierarchy with the formal authority to make each decision.
- **Standardization:** Standardization of procedures is a basic aspect of organizational structure. A procedure is taken to be an event that has regularity of occurrence and is legitimized by the organization. There are rules or definitions that purport to cover all the circumstances and that apply invariably.
- **Formalization:** Formalization denotes the extent to which rules, procedures, instructions, and communications are written. This dimension of organizational structure is concerned with formalization of Role definition, Information passing, and Recording of Role performance.

- **Specialization:** Specialization is concerned with the division of labor within the organization, the distribution of official duties among a number of positions. It denotes whether an activity is specialized in an organization; that is, performed by someone with that function and no other, who is not in the workflow superordinate hierarchy. A second aspect of specialization is the extent to which specialist role exist within each function, i.e., role specialization.
- **Complexity of Workflow:** Complexity of workflow refers to how jobs move in an organization. Two extreme cases are as follows: In a assembly line kind of setup workflow is extremely smooth. Jobs move in a line. Whereas in a job shop the work or 'job' goes back and forward several times making it complex. There could be many cases in between these extreme cases.

2.10 Functions of an Executive and roles of Managers

Barnard Chester, 1966 in his book “ The Functions of an Executive ” identifies following as important components of manager's function.

- Strategy formulation and Implementation
- Delegation
- Sharing of Privileged information
- Managing informal networks
- Securing co-ordination among different functions.

Wilson, Fiona M., 1999 in paper, “The view from above: Managers – What they Do and How their work is Described”, reviews various papers on functions of managers and how do they perform these functions and organize their time. It describes additional components of job of a manager as maintaining informal networks, developing people skills and use of power. They emphasize that managerial activity is high on Oral communication.

2.11 Effect of Computers on Organization Structure

Computerization was associated with both centralization and decentralization in an organization (Robey, Daniel, 1977).

2.12 In this work we borrow from the works of Miles and Snow et. al. (1978). Hence a brief of their work is reproduced here.

Strategy types chosen by firm

In their work Miles, Snow, Meyer and Coleman (1978) develop a framework that relates broad strategy chosen to the decisions of a manufacturing organizations. They have identified alternative ways in which organizations can define their strategies and mechanisms of structure and process to pursue these strategies. Briefly, Miles and Snow et. al. (1978) have identified four broad strategy types pursued by organizations and these are Defenders, Prospectors, Analyzers, and reactors.

‘Defenders’ have narrow and stable product domains and cost efficient single core technology. They have low product variety, have centralized control and tendency towards high vertical integration. ‘Prospectors’ seek to maintain their reputation as an innovator in product and market development. They focus on multiple technologies and have low division of labour, low formalization, complex co-ordination mechanism, decentralized control and high product variety. ‘Analyzer’ in an organization is one which attempts to minimize risk while maximizing profit – i.e., an Analyzer combines the strength of both Prospector and Defender. ‘Reactors’ exhibits a pattern of adjustment to the environment that is both inconsistent and unstable; this type lacks a set of response mechanisms which can be consistently put into effect when faced with a challenging environment. Reactors pursue a “residual” strategy, arising when one of the other three strategies is improperly pursued.

Relating Strategic position and Dimensions of Organizational structure

Objectives of Manufacturing decision	Dimensions of organization structure	
High Product Variety (Prospector)	Specialization	Low
	Standardization	Low
	Formalization	Low
	Centralization	Low
	Complexity of Workflow	High
Low Product Variety (Defender)	Specialization	High
	Standardization	High
	Formalization	High
	Centralization	High
	Complexity of Workflow	Low

CHAPTER 3

PLAN OF CURRENT WORK

Earlier researches in the field of ERP are mainly focussed on Pre-implementation & Implementation strategies and Post implementation evaluation for a successful implementation of ERP systems. There is no considerable research on what effect ERP has on the Organizational Structure and Manager's job after implementation.

These types of researches in the field of IT introduction and computerization in organizations are available which show ample evidence of changes in structure due to these.

As ERP systems are not just an IT project, it effects the whole organization by changing the way the company is organized and often acting against the prevailing company culture, so we want to evaluate the impact of ERP on few parameters of organizational structure and Manager's job.

We wish to see the effect on the following parameters of Organization structure as identified by Pugh et. al. (1968):

- 1) Standardization
- 2) Specialization
- 3) Centralization
- 4) Formalization
- 5) Complexity of Workflow

Following dimensions of Manager's job (Wilson, Fiona M. , 1999) are also investigated :

- 1) Use of Power

- 2) Delegation
- 3) Privileged Information sharing
- 4) Inter Personal Skills (People Skills)
- 5) Autonomy

We also study the impact of ERP on Flexibility.

For finding out effect on these parameters relevant questionnaire was prepared with the available literature. The Questionnaire on Organization structure was borrowed from Pugh et. al. (1968) and suitably modified. The scale on Autonomy was borrowed from Cook et. al. Items on Power were borrowed from Heller, F A. , Drenth PJD, Koopman P., Rus V (1977). Scales on other items were prepared by us. The questionnaire is presented in Appendix 1.

CHAPTER 4

DATA COLLECTION

This study was conducted in three plants (P, J &L) of a large automobile manufacturing organization of India. This organization has implemented SAP as ERP solution at all its locations and started working on SAP in year 1998-99. So at the time of study the organization had worked for 6 years with SAP.

Questionnaire was used to collect data from the managers. Only Top, Middle, and lower level managers filled up the questionnaires. The questionnaire focuses on five dimensions of Organizational structure and areas of a managers job as given in the preceding section. Employees were asked to give rating for before ERP scenario and after ERP scenario for all the questions. The questionnaire employed different scales for different parameters. This survey was done during December 2004 to January 2005.

Employees were selected from the following areas as these were the areas which were highly influenced with ERP implementation:

- Finance
- Production
- Logistics
- Planning
- Other support areas using ERP extensively

Other criterion for choosing employees was that they should have seen both the before and after ERP eras while being in the same organization.

Breakup of respondents at all the locations in different Management cadres (Senior, Middle, and Junior) is given in Table 1.

The Raw data gathered with the questionnaires is given in Appendix 2.

During the time of ERP implementation, the organization experienced changes in its strategy and it became a Prospector after it was a defender for a long time (Defender in the terminology of Miles & Snow et. al. (1978). This is supported by company document which is reproduced in appendix 3. This document was submitted by the company to audit agency for getting Business excellence award. This goes on to show that the firm has chosen to become a 'Prospector' since 1999. Till 1990 it was a single product company mainly making one model only.

CHAPTER 5

DATA ANALYSIS & RESULTS

5.1 Reliability test for Scales

Cronbach's Alpha is calculated for accessing the reliability of the different scales used in Questionnaire. Cronbach's alpha measures how well a set of items (or variables) measures a single unidimensional latent construct. It is a coefficient of reliability (or consistency). If the value of alpha is high, then there is evidence that the items are measuring the same underlying construct which means that they have reasonably good reliability. They are referring to how well their items measure a single unidimensional latent construct.

Values of Cronbach alpha for before and after ERP for all the parameters are given in Table 2. The values of Cronbach's alpha revealed a good level of reliability which permits us to draw conclusions after data analysis.

Table 3 to table 16 summarizes the impact of ERP implementation. All the questions for Power, Privileged information, Delegation, People Skills, Flexibility, and Autonomy are rated on a 4-point scale, Standardization, Formalization, and Complexity of workflow are rated on 7-point scale, Specialization is rated on 2-point scale and Centralization is rated on 6-point scale. The results show the average of before and after ERP ratings, t-value for the difference between means and level of confidence at which this difference is significant (* for 90%, ** for 95%, and *** for 99%).

5.2 Use of Power

Power with the Computer professionals/ person who are expert in software operations increases for all the management levels across all locations except Middle level of L. This increase is significant in all the cases except middle level of P. Management grip over the company increases significantly as per all management levels and locations. Management encouragement for participation of all (in general) in the

company increases significantly as per all management levels and locations. Manager's control over their subordinates increases as per all management levels and locations but this difference is not significant for P and senior level of L. Regarding management following "authoritative" style of management due to ERP there is no or insignificant increase for all the cases except L middle where this increment is significant at 90%. Regarding management tendency to consult everyone concerned before taking a decision due to ERP there is no or insignificant increase for all the cases except J middle & senior levels where this increment is significant at 95%. Aggregately (with all questions taken together) use of power increases significantly (at 99%) for all the management levels across all locations.

5.3 PEOPLE SKILLS

Need for maintaining informal relations for discharging official duties also remains nearly same for Senior and middle managers and lower level managers think that need for this type of relations has decreased.

5.4 PRIVILEGED INFORMATION

Managers at middle level at all locations feel that the amount of privileged information availability with them has increased and for all other levels it is same or increased insignificantly.

5.5 DELEGATION

Level of delegation has increased significantly for Middle & Senior levels but in Junior level there seems to be no significant change due to ERP. There is not much change in routine task delegation in senior level as these type tasks were already delegated to middle managers by them earlier also, but in middle level delegation of routine tasks has increased significantly for plants P and J. There is increase for plant L middle also but it is not significant. For Junior level there is not much change except for plant L. For Senior managers decision making tasks have become more which not the case with middle and junior levels except for plant L middle level.

5.6 FLEXIBILITY

Flexibility of the organization in terms of ability to quickly implement new procedure / plans /process etc has increased.

5.7 AUTONOMY

Autonomy with all levels of managers at all locations has increased significantly except for L Junior managers.

5.8 STANDARDIZATION

Standard procedures in organization to be applied to management/administrative processes has increased significantly. There was only one question under this item.

5.9 SPECIALIZATION

As per middle management level specialization of the organization has increased significantly while senior and junior levels says that there is not much change in level of specialization, their average scores indicate that the company was fairly specialized earlier also.

5.10 CENTRALIZATION

Centralization is decreased in all locations. Management level at which most of the decisions regarding Labor & Supervisory force requirements, their appointments, promotions, Identification and decision on procurement of new machinery & on new Products, Decision on Production plans & Welfare facilities & Prices of output are taken, has come down.

5.11 FORMALIZATION

Written instructions to workers, are written terms of reference or job description availability & use of written policies in the organization has increased across all the

locations. So the Formalization after ERP implementation has increased significantly at all the locations and all the management levels.

5.12 COMPLEXITY OF WORKFLOW

Complexity of workflow has increased at all the locations as per all management levels except J Senior level managers.

5.13 IMPLEMENTATION WORK AND STRATEGY FORMULATION WORK OF A MANAGER

Average percentage of the time managers spend in implementation work (chasing people, data acquisition etc.) has reduced for all management levels across all locations. Plant L experiences highest change which averages 51% reduction. In plant P & J average reduction is 31% and 38% respectively. Across management levels this reduction is around 37% for junior and middle levels and 45% for senior level.

Average percentage of time spent on planning activities or strategy formulation, giving guidance to sub-ordinates etc has increased for all management levels across all locations. Senior and middle management level experience major improvement in this. Plant J and L are more benefited than plant P in getting more time for planning activities with ERP implementation.

85% respondents says that ERP has led to better co-ordination in terms of accessing information, resources, people etc. to a large certain. Same results we found regarding ERP led to better information integration.

Nearly 64% managers feel that ERP has changed the ways they used to do work to a large certain and 32% feel that they are affected to some extent only.

54% managers says that ERP has resulted in impact on the culture and goal setting in the organization to a large certain and 43% says that this impact is to some extent.

63% managers says that ERP has changed the ways they serve their customers to a large certain and 30% says that this change is to some extent.

With ERP implementation average decrease in order to ship time after ERP implementation is 36%.

CHAPTER 6

DISCUSSION

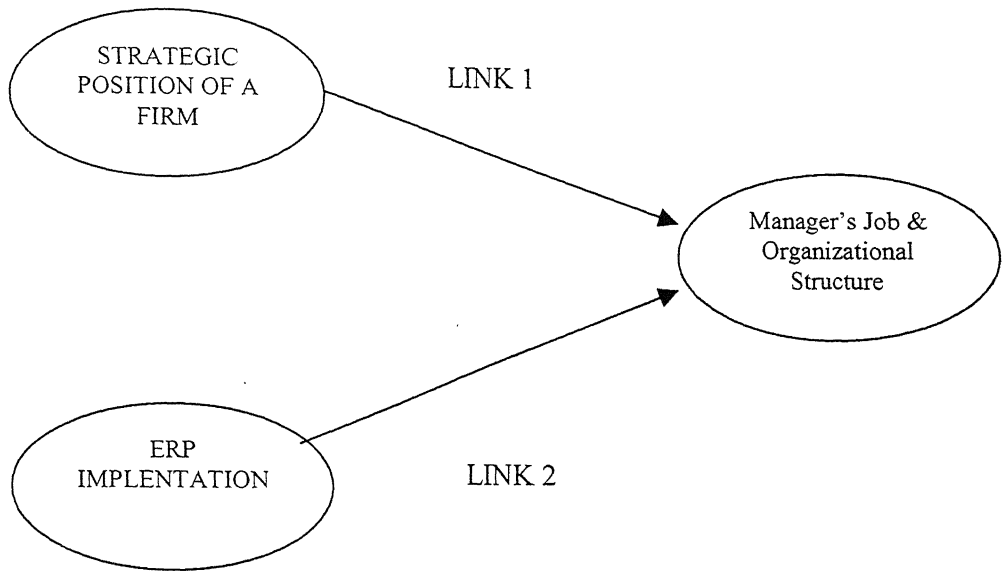
As Complexity of Workflow has increased it leads to conclusion that the company has become a 'Prospector' in the terminology of Miles and Snow et. al. (1978), see appendix 3.

Check for consistency: Miles and Snow et. al. (1978) hypothesizes that "Prospectors" would have low centralization. This has indeed happed. With decentralization, delegation also has gone up (another consistent finding from data). With increased decentralization and delegation, autonomy has also gone up (which is again a consistent finding from the data).

According to Miles and Snow et. al. (1978) "Prospectors" would have low specialization, standardization and formalization. But all these (specialization, standardization and formalization) have actually gone up. Porter (2002) has said that "As a result IT has been a force for standardizing activities and spreading competitive convergence." Due to the discipline of software, IT and its hardware on another area of specialization has been added. With ERP implementation all the data available at one place lead to increased formalization. Thus the data obtained seems to verify the following hypothesis.

Hypothesis 1 : ERP implementation would lead to increases specialization, formalization and increased use of standard processes.

Fredrickson (1986) has hypothesized that formalization threatens professional autonomy (See Perrow, 1972). However we do not find support to this here. Here autonomy has gone up and this could be due to increased delegation and decentralization which has come about due to change in firm's strategic position: "Prospector". This suggests a model which is given below.



Model developed in this thesis

Link 1 indicates effect of Strategic position and link2 corresponds to ERP implementation and their influence on organizational structure & manager's job.

Nearly during the same period when ERP was being implemented, the organization also added up in their product variety (Model base and their varieties), so it was important for the Top management to give sufficient autonomy to the local management of different sites so that they can take decisions and manage as per the environment prevalent at that location. This is also reflected by different work culture at different locations. So effects of Link 1 appear to be stronger than effects of link2 in this case.

Theoretical Prediction

If the company were a defender, then there would be higher centralization, formalization & standardization (Miles & Snow et. al., 1978) as a result autonomy to its managers would be less and ERP implementation with its attendant formalization & standardization would further erode autonomy (Fredrickson, 1986) and Perrow (1972). Hence we have following hypothesis:

Hypothesis 2: If a "Defender" implements ERP then it is likely that autonomy would be further eroded.

This may be verified by a future study.

Organization has maintained a sense of balance in the use of power and granting autonomy to its managers. Increased autonomy (as found empirically in our data) is likely to lead to managers taking different directions. Top management through the use of increased power may have attempted to integrate the diverse decisions of different managers. Also increased power use may have facilitated strategic change from 'Defender' to 'Prospector' (Hardy, 1996) and also to facilitate 'Change management' resulting due to ERP implementation.

CHAPTER 7

CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

This study focussed on the change in Manager's job and organizational structure, due to ERP implementation. We analyzed the data collected on these parameters for the differences in means of before and after ERP scenarios and found changes in manager's job for the organization chosen. We found use of power increased significantly with ERP implementation. This could be to facilitate the change process. This is consistent with all management levels. Change in need for maintaining informal relations was not that profound and had shown effect for lower level only where this has decreased.

We found that Flexibility of the organization has increased with ERP. Regarding organization structure we found that standardization, specialization and formalization has increased due to ERP implementation.

We have presented one hypothesis based on our findings which can be verified in future studies for the case of 'Defender' implementing ERP which may be verified by future work.

Table 1

Plant wise breakup of Respondents in various management levels

Plant	Management Level		
	Senior	Middle	Junior
P	2	9	7
J	7	9	6
L	3	13	12

Table 2

Cronbach Alpha Values

Parameters	B ERP	A ERP
Power	0.6896	0.4439
Autonomy	0.8163	0.8508
Delegation	0.7375	0.6096
Specialization	0.7296	0.5864
Centralization	0.5062	0.5266
Formalization	0.8403	0.8602
Complexity of work flow	0.7117	0.3571

Table 3

Results for Use of Power

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.000	2.500		1.857	3.143	-6.971 ***	2.667	3.667	#DIV/0!
2	2.000	3.500		2.286	3.571	-4.500 ***	3.000	4.000	#DIV/0!
3	2.500	3.500		2.000	3.286	-3.576 ***	2.667	3.667	#DIV/0!
4	2.500	3.500		2.000	3.286	-4.500 ***	3.000	3.333	-1.000
5	2.500	2.500		1.571	1.714	-1.000	3.000	3.000	0.000
6	2.000	2.500		2.571	3.286	-1.987 **	2.667	2.667	#DIV/0!

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.222	2.333	-0.359	2.222	2.778	-1.474 *	2.385	2.231	0.433
2	2.333	3.111	-3.500 ***	2.667	3.667	-4.243 ***	2.154	3.538	-5.740 **
3	2.556	2.778	-1.512 *	2.667	3.556	-2.874 **	2.385	3.077	-3.959 ***
4	2.778	2.889	-1.000	2.778	3.333	-1.644 *	2.308	3.154	-3.395 ***
5	2.222	2.444	-0.800	2.000	2.222	-1.000	1.923	2.385	-1.720 *
6	2.778	3.000	-1.000	2.375	3.000	-2.376 **	2.308	2.077	0.762

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.429	3.000	-1.922 *	2.000	3.333	-6.325 ***	2.167	2.583	-2.159 **
2	3.143	3.857	-3.873 ***	2.667	3.667	-2.739 **	2.333	3.333	-5.745 ***
3	2.000	2.714	-1.987 **	2.667	3.500	-2.712 **	2.583	3.083	-2.569 **
4	2.857	3.000	-1.000	2.500	3.000	-2.236 **	2.333	3.167	-5.000 ***
5	2.857	3.000	-0.548	2.333	2.833	-1.168	1.917	2.250	-1.000
6	2.429	2.429	#DIV/0!	2.833	3.000	-1.000	2.500	2.583	-0.364

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	2.250	3.000	-3.000 ***	2.481	2.759	-2.982 ***	2.619	3.000	-3.736 ***
J	2.048	3.048	-7.842 ***	2.453	3.094	-5.312 ***	2.500	3.222	-5.565 ***
L	2.833	3.389	-3.828 ***	2.244	2.744	-4.007 ***	2.306	2.833	-5.567 ***

Overall Comparison

	B ERP	A ERP	t - Value
P	2.509	2.880	-5.459 ***
J	2.336	3.115	-10.560 ***
L	2.333	2.851	-7.180 ***

Table 4

Results for Delegation

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	3.000	3.500		3.000	3.714	-2.500 **	3.000	3.667	-2.000 *
2	3.500	4.000		2.571	3.000	-1.162	2.667	3.667	-1.732
3	3.500	4.000		2.857	3.571	-2.500 **	3.000	3.667	-2.000 *

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.444	3.222	-3.500 ***	2.444	2.444	0.000	2.154	2.923	-3.825 ***
2	2.556	3.111	-3.162 ***	2.222	2.889	-2.309 **	2.769	2.923	-0.617
3	2.444	2.556	-0.359	2.333	2.556	-0.800	2.231	2.769	-2.941 ***

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.286	2.143	0.420	2.333	2.667	-1.000	2.583	2.583	0.000
2	2.571	2.429	0.420	2.333	2.500	-0.349	2.667	3.167	-1.915 **
3	1.714	1.857	-1.000	2.333	2.833	-1.464	2.750	2.917	-0.616

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	3.333	3.833	-2.236 **	2.481	2.963	-3.323 ***	2.190	2.143	0.295
J	2.810	3.429	-3.525 ***	2.333	2.630	-1.688 *	2.333	2.667	-1.558 **
L	2.889	3.667	-3.500	2.385	2.872	-3.849 ***	2.667	2.889	-1.276

Overall Comparision

	B ERP	A ERP	t - Value
P	2.463	2.741	-2.676 ***
J	2.485	2.894	-3.791 ***
L	2.560	2.964	-4.091 ***

Table 5

Results for Autonomy

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.500	3.000		2.667	2.833	-0.542	3.000	2.667	0.378
2	1.500	2.000		2.000	2.500	-1.168	1.333	2.000	-1.000
3	2.000	2.000		1.833	2.000	-0.415	1.333	2.000	-0.555
4	3.000	3.000		2.667	3.167	-1.464	2.667	3.333	-2.000 *
5	3.500	3.500		3.167	3.333	-1.000	2.667	3.667	-1.732
6	3.500	3.500		3.000	3.333	-1.581 *	2.667	3.667	-1.732
7	3.500	3.500		3.000	3.667	-2.000 *	2.667	3.667	-1.732
8	3.000	3.000		2.667	3.167	-2.236 **	2.667	3.333	-2.000 *
9	3.000	3.500		2.500	3.833	-4.000 ***	2.667	4.000	-4.000 **
10	3.000	3.000		2.833	3.500	-2.000 *	3.000	3.333	-1.000
11	3.000	3.000		2.667	3.500	-2.712 **	3.333	3.000	0.378
12	3.000	3.000		2.500	3.333	-2.712 **	3.000	3.000	0.000

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.500	2.250	1.528 *	2.750	2.125	1.930 **	2.500	2.417	0.364
2	1.750	1.750	0.000	1.875	2.750	-2.198 **	2.154	2.615	-1.477 *
3	1.500	1.250	1.000	2.000	1.625	1.426 *	2.077	1.538	2.501 **
4	1.875	2.250	-2.164 **	2.750	2.750	0.000	2.538	2.385	0.562
5	2.125	2.625	-2.376 **	2.625	3.000	-1.000	2.692	2.846	-0.562
6	2.375	2.750	-2.049 **	2.750	3.000	-0.552	2.538	2.846	-1.171
7	2.500	3.000	-2.646 **	2.750	3.000	-0.552	2.538	2.846	-1.298
8	2.375	3.000	-2.376 **	2.750	3.000	-0.683	2.667	2.833	-1.483 *
9	2.500	3.000	-1.871 *	2.250	3.500	-3.035 ***	2.385	3.231	-2.856 ***
10	2.375	2.500	-0.424	2.500	3.250	-2.393 **	2.846	2.846	0.000
11	2.500	2.750	-1.000	2.500	3.250	-2.049 **	2.769	2.385	1.328
12	2.375	2.875	-2.646 **	2.750	3.000	-1.000	2.308	2.462	-1.477 *

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.286	2.286	0.000	2.000	2.500	-1.168	2.667	3.000	-1.173
2	1.714	2.000	-1.549 *	2.167	2.667	-1.168	2.250	2.583	-1.000
3	2.143	1.857	1.000	2.000	1.500	2.236 **	2.583	1.750	2.803 ***
4	2.000	2.143	-1.000	2.333	2.500	-0.542	2.667	2.833	-0.692
5	1.714	1.857	-1.000	2.333	3.000	-1.348	2.667	3.000	-1.773 *
6	1.714	1.857	-1.000	2.333	3.167	-2.076 **	2.583	2.750	-0.804
7	2.143	2.000	1.000	2.000	3.000	-3.873 ***	2.750	2.833	-0.561
8	2.429	2.714	-1.000	2.000	3.167	-3.796 ***	2.833	3.000	-1.000
9	2.571	2.714	-0.548	2.333	3.333	-1.936 *	2.500	3.167	-2.966 ***
10	2.143	2.143	0.000	2.333	3.167	-1.746 *	2.667	2.917	-1.000
11	2.286	2.286	0.000	2.167	2.833	-1.581 *	2.750	2.750	0.000
12	2.571	2.714	-1.000	2.333	3.167	-2.712 **	2.667	2.833	-0.616

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	2.875	3.000	-1.813 **	2.229	2.500	-3.946 ***	2.143	2.214	-1.228
J	2.625	3.181	-6.003 ***	2.521	2.854	-2.964 ***	2.194	2.833	-5.515 ***
L	2.583	3.139	-3.084 ***	2.500	2.604	-1.356 *	2.625	2.778	-2.048 **

Overall Comparison

	B ERP	A ERP	t - Value
P	2.240	2.412	-4.253 ***
J	2.442	2.900	-7.504 ***
L	2.563	2.737	-3.344 ***

Table 6

Results for Specialization

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	2.000	2.000		1.800	1.800	#DIV/0!	2.000	2.000	--
2	2.000	2.000		1.750	2.000	-1.000	2.000	2.000	--
3	1.500	2.000		1.600	1.800	-1.000	1.167	1.167	--

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	1.625	1.875	-1.528 *	1.375	1.875	-2.646 **	1.385	1.846	-3.207 ***
2	1.556	1.889	-2.000 **	1.250	1.875	-3.416 ***	1.192	1.731	-3.742 ***
3	1.556	1.889	-2.000 **	1.333	1.667	-1.414 *	1.333	1.767	-2.276 **

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	1.857	2.000	-1.000	1.833	1.833	#DIV/0!	1.750	2.000	-1.528 *
2	1.714	1.857	-1.000	1.833	1.833	#DIV/0!	1.571	2.000	-2.121 **
3	1.667	1.500	1.000	1.333	1.500	-0.542	1.625	1.625	#DIV/0!

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	1.833	2.000	-1.000	1.577	1.885	-3.333 ***	1.750	1.800	-0.567
J	1.714	1.857	-1.472 *	1.320	1.800	-4.096 ***	1.667	1.722	-0.566
L	1.722	1.722	#DIV/0!	1.303	1.782	-5.337 ***	1.652	1.870	-2.472 *

Overall Comparison

	B ERP	A ERP	t - Value
P	1.673	1.865	-3.120 ***
J	1.526	1.789	-3.832 ***
L	1.471	1.803	-5.530 ***

Table 7

Results for Centralization

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	4.000	3.000		4.000	3.000	2.646 **	4.667	4.333	1.000
2	4.000	3.500		4.000	3.571	2.121 **	4.667	4.667	#DIV/0!
3	4.000	3.500		4.333	4.000	1.581 *	4.333	4.333	#DIV/0!
4	5.500	5.500		5.000	4.667	1.581 *	4.667	4.667	#DIV/0!
5	3.500	3.000		4.167	3.500	2.000 *	4.333	4.000	1.000
6	5.000	5.000		4.571	4.286	1.000	3.667	3.667	#DIV/0!
7	5.500	5.500		5.167	5.167	#DIV/0!	4.667	4.667	#DIV/0!

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	3.250	3.750	-1.871 *	3.167	3.000	1.000	3.769	3.615	1.000
2	3.250	3.750	-1.871 *	3.500	3.500	#DIV/0!	4.231	4.000	1.897 **
3	4.125	4.375	-1.528 *	4.333	4.333	#DIV/0!	4.417	4.250	1.483 *
4	4.750	4.875	-1.000	5.000	5.000	#DIV/0!	5.083	4.750	2.345 **
5	4.000	4.250	-1.528 *	3.333	3.167	1.000	4.917	4.750	1.483 *
6	4.500	4.750	-1.528 *	4.500	4.500	#DIV/0!	5.333	5.167	1.483 *
7	4.875	5.125	-1.528 *	5.500	5.500	#DIV/0!	5.833	5.833	#DIV/0!

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	3.429	3.429	#DIV/0!	3.500	3.333	1.000	3.545	3.273	1.399 *
2	4.286	4.286	#DIV/0!	4.000	3.833	1.000	3.818	3.727	1.000
3	4.429	4.429	#DIV/0!	4.833	4.667	1.000	4.182	3.636	2.631 **
4	5.143	5.000	1.000	5.500	5.500	#DIV/0!	4.364	4.000	1.491 *
5	4.143	4.143	#DIV/0!	3.167	3.167	#DIV/0!	3.727	3.273	2.887 ***
6	5.000	5.000	#DIV/0!	4.833	4.833	#DIV/0!	4.455	4.364	1.000
7	5.286	5.286	#DIV/0!	5.667	5.667	#DIV/0!	5.000	5.125	-1.000

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	4.500	4.143	2.687 ***	4.107	4.411	-4.233 ***	4.531	4.510	1.000
J	4.444	4.000	4.304 ***	4.190	4.143	1.432 *	4.500	4.429	1.776 **
L	4.429	4.333	1.451 *	4.779	4.605	3.932 ***	4.122	3.865	3.842 ***

Overall Comparison

	B ERP	A ERP	t - Value
P	4.328	4.420	-2.149 **
J	4.380	4.186	4.535 ***
L	4.470	4.271	5.618 ***

Table 8

Results for Formalization

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	3.000	6.000		3.000	4.000	-2.291 **	4.333	5.333	-1.732
2	6.000	6.000		6.143	6.143	#DIV/0!	5.333	5.667	-1.000
3	4.000	5.500		4.143	4.714	-1.922 *	5.000	5.333	-1.000

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	6.000	6.143	-1.000	4.167	4.667	-1.464	3.083	5.250	-3.398 ***
2	5.875	6.125	-1.528 *	4.833	4.833	#DIV/0!	3.917	5.667	-2.836 ***
3	5.250	5.750	-1.871 *	4.167	4.500	-1.000	3.000	4.750	-3.169 ***

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	4.143	5.286	-2.828 **	4.000	5.167	-2.445 **	3.909	6.000	-3.610 ***
2	4.857	6.000	-2.828 **	5.500	5.500	#DIV/0!	5.091	6.273	-2.797 ***
3	3.714	4.286	-1.922 *	3.833	5.500	-3.953 ***	4.000	5.545	-2.833 ***

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	4.333	5.833	-2.666 **	5.696	6.000	-2.612 ***	4.238	5.190	-4.483 ***
J	4.429	4.952	-2.750 **	4.389	4.667	-1.761 **	4.444	5.389	-3.610 ***
L	4.889	5.444	-2.294 **	3.333	5.222	-5.557 ***	4.333	5.939	-5.387 ***

Overall Comparison

	B ERP	A ERP	t - Value
P	4.920	5.640	-5.368 ***
J	4.421	5.000	-4.726 ***
L	3.936	5.551	-7.817 ***

Table 9

Results for Complexity of Workflow

Management level - Senior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	5.000	5.500		5.714	5.714	#DIV/0!	4.667	6.000	-1.512
2	5.000	6.000		6.000	6.000	#DIV/0!	3.667	4.667	-1.732
3	5.500	5.500		2.429	2.429	#DIV/0!	2.667	3.000	-1.000
4	5.500	5.500		5.429	5.429	#DIV/0!	4.000	5.667	-1.890 *

Management level -Middle

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	5.000	5.625	-1.667 *	5.167	5.333	-1.000	3.556	5.333	-2.530 **
2	5.250	5.625	-2.049 **	5.333	5.833	-1.464	3.500	5.500	-2.739 **
3	4.000	5.286	-1.591 *	3.500	3.333	1.000	2.222	3.444	-1.739 *
4	5.250	5.625	-2.049 **	4.000	4.500	-1.464	2.700	4.300	-3.073 ***

Management level -Junior

Q No.	P			J			L		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
1	3.571	4.143	-1.922 *	5.833	5.833	#DIV/0!	4.455	5.818	-2.246 **
2	4.286	5.143	-1.867 *	5.500	6.167	-2.000 *	4.545	5.818	-2.055 **
3	4.000	4.000	#DIV/0!	4.167	4.500	-1.000	3.500	4.600	-1.766 *
4	4.143	4.429	-1.000	4.000	4.667	-2.000 *	4.545	5.818	-2.219 **

All Questions

	Senior			Middle			Junior		
	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value	B ERP	A ERP	t - Value
P	5.250	5.625	-1.426 *	4.903	5.548	-2.997 ***	4.000	4.444	-2.726 ***
J	4.893	4.893	#DIV/0!	4.500	4.750	-1.813 **	4.875	5.292	-2.846 ***
L	3.750	4.833	-3.223 ***	3.000	4.658	-5.135 ***	4.279	5.535	-4.298 ***

Overall Comparison

	B ERP	A ERP	t - Value
P	4.576	5.106	-4.261 ***
J	4.763	4.974	-3.203 ***
L	3.688	5.086	-7.225 ***

Table10**Results for People Skills**

	SENIOR			MIDDLE			LOWER		
	B ERP	A ERP	t Value	B ERP	A ERP	t Value	B ERP	A ERP	t Value
P	3.000	3.000		2.556	2.444	0.426	3.333	2.667	1.348
J	2.857	3.000	-1.000	3.000	3.000	0.000	2.833	2.500	1.581 *
L	3.000	3.000	#DIV/0!	2.538	2.692	-0.433	2.667	2.083	2.244 **

Table11**Results for Privileged Information**

	SENIOR			MIDDLE			LOWER		
	B ERP	A ERP	t Value	B ERP	A ERP	t Value	B ERP	A ERP	t Value
P	2.500	2.500		1.778	2.111	-2.000 **	2.000	2.429	-1.162
J	1.857	2.429	-2.828 **	2.778	2.000	2.135 **	2.400	2.600	-0.535
L	2.333	2.667	-1.000	2.077	2.615	-2.007 **	2.250	2.583	-0.886

Table12**Results for Flexibility**

	SENIOR			MIDDLE			LOWER		
	B ERP	A ERP	t Value	B ERP	A ERP	t Value	B ERP	A ERP	t Value
P	2.000	3.500		2.333	2.889	-2.294 ***	2.143	2.429	-1.549 *
J	2.000	3.714	-6.000 ***	1.889	3.111	-3.355 ***	1.833	3.167	-4.000 ***
L	2.667	3.667	-1.732	2.538	2.923	-1.237	2.417	3.250	-4.022 ***

Table13**Results for Standardization**

	SENIOR			MIDDLE			LOWER		
	B ERP	A ERP	t Value	B ERP	A ERP	t Value	B ERP	A ERP	t Value
P	3.000	6.000		4.125	5.000	-1.825 *	2.429	4.000	-4.260 ***
J	3.000	5.000	-2.928 **	3.111	4.556	-4.914 ***	3.000	4.000	-1.936 *
L	3.667	5.000	-2.000 *	3.000	4.923	-6.218 ***	3.250	4.583	-2.464 **

Table 14

Results for Implementation work and Strategy formulation work of a Manager
Question no. 1 & 2

Management level - Senior

Q No.	P		J		L	
	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
1	12.50	7.50	52.50	35.00	44.29	28.33
2	87.50	92.50	28.20	52.50	31.54	46.31

Management level -Middle

Q No.	P		J		L	
	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
1	36.67	28.33	32.86	15.00	50.63	32.50
2	32.50	40.00	26.43	41.43	36.25	46.25

Management level -Junior

Q No.	P		J		L	
	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
1	52.00	35.00	47.50	35.00	42.78	18.33
2	59.00	68.00	40.00	45.00	54.44	71.67

Table 15

Results for Implementation work and Strategy formulation work of a Manager
Question no. 3 to 7

Percentage of Respondents

Q. No.	Option	P			J			L		
		Senoir	Middle	Junior	Senoir	Middle	Junior	Senoir	Middle	Junior
3	1	100.00	75.00	57.10	100.00	100.00	80.00	100.00	83.30	75.00
	2	0.00	12.50	42.90	0.00	0.00	20.00	0.00	16.70	25.00
	3	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1	100.00	75.00	42.90	85.70	100.00	80.00	100.00	100.00	75.00
	2	0.00	12.50	42.90	14.30	0.00	20.00	0.00	0.00	25.00
	3	0.00	12.50	14.30	0.00	0.00	0.00	0.00	0.00	0.00
5	1	50.00	62.50	57.10	85.70	75.00	60.00	100.00	50.00	33.20
	2	50.00	25.00	28.60	14.30	25.00	40.00	0.00	50.00	58.50
	3	0.00	12.50	14.30	0.00	0.00	0.00	0.00	0.00	8.30
6	1	50.00	71.00	71.40	71.40	50.00	60.00	33.00	41.70	41.50
	2	50.00	29.00	28.60	28.60	50.00	40.00	66.00	50.00	41.50
	3	0.00	0.00	42.90	0.00	0.00	0.00	0.00	8.33	16.70
7	1	50.00	75.00	14.30	100.00	100.00	100.00	33.00	50.00	50.00
	2	50.00	12.50	71.40	0.00	0.00	0.00	66.00	41.70	25.00
	3	0.00	12.50	14.30	0.00	0.00	0.00	0.00	8.30	25.00

Table 16

Results for Implementation work and Strategy formulation work of a Manager
Question no.8

Average Percentage of time

Q. No.	P			J			L		
	Senoir	Middle	Junior	Senoir	Middle	Junior	Senoir	Middle	Junior
8	25.00	37.50	35.00	72.00	35.00	30.00	40.00	25.71	24.29

References

Barnard Chester. *The Functions of an Executive*. Harvard University Press, Cambridge, Massachusetts, 1966

Bass B., Valenzi E. R., Farrow P. L., Solomen R. J. *Management style association with organizational task, Personal and interpersonal contingencies*. Journal of Applied Psychology, 1975, pp 720-729

Cook, Hepwar, Wall, Wass. *The experience of work*. IIT Kanpur Library details, '158.7/ Ex 71, A 80286.

Elisabeth J. Umble, Ronald R. Haft and M. Michael. *Enterprise resource planning: Implementation procedures and critical success factors*. European Journal of Operational Research, Volume 146, Issue 2 , 16 April 2003, Pages 241-257.

F. Robert Jacobs & D. Clay Whybark. *WHY ERP? A Premier on SAP Implementation*. Irvin, Mc Graw Hill, 2001, Singapore.

F. Robert Jacobs and Elliot Bendoly. *Enterprise resource planning: Developments and directions for operations management research*. European Journal of Operational Research, Volume 146, Issue 2 , 16 April 2003, Pages 233-240

Fredrickson James W.. *The Strategic Decision Process and Organization Structure*. Academy of Management Journal, 1986, Vol. 11, No.2, 280-297.

Hardy C. *Understanding Power: Bringing about strategic change*. British Journal of Management, Volume 7, Special Issue, S3-S16, March 1996.

Heller, F A. , Drenth PJD, Koopman P., Rus V. *A Longitudinal study in Participative decision making*. HR, Volume 30, Number 7, 1977, pp. 567-587

J. Sarkis , A. Gunasekaran. *Enterprise resource planning modeling and analysis*. European Journal of Operational Research, Volume 146, Issue 2 , 16 April 2003, Pages 229-232

Jan and Erik Selldin. *Enterprise resource planning survey of Swedish manufacturing firms*. European Journal of Operational Research, Volume 146, Issue 2, 16 April 2003, Pages 365-373

Miles RE, Snow CL, Meyer AP, Coleman HJ. *Organization strategy, Structure and processes*. Academy of Management Review, Volume 3, 1978, pp 546-562.

Miller Danny. *Strategy making and structure : Analysis and implications for performance*. Academy of Management Journal, 1987, Vol. 30, No.1, 7-32.

Perrow C, Colenview I L. *Complex organization : A critical essay*. 1972. Scott, Foresman.

Porter M E. *Strategy and Internet*. HBR on Advances in Strategy, HBS Publising, 2002, p28.

Pugh DS, Hickeon DJ, Hinings CR, Turner C. *Dimensions of Organizational Structure*. Adminisrative Science Quarterly, Volume 13,1968, Page 65-91

Purnendu Mandal and A. Gunasekaran. *Issues in implementing ERP: A case study*. European Journal of Operational Research, Volume 146, Issue 2, 16 April 2003, Pages 274-283

R.R.K. Sharma, Shobhit Shrotriya, Anshuman Behera. *Relating objectives to manufacturing decisions in dynamic environments: implications of an exploratory study of Indian and German manufacturing firms*. Int. J. of Manufacturing Technology and Management, Vol. 5, No. 5/6, 2003, pp 472-491.

Robey Daniel. *Computers and Management Structure : Some empirical findings reexamined*. HR, Volume 30, Issue 11, Page 963-975

Sanjay Kumar, *A study of change in the Manager's job due to process change and ERP implantation with the focus on managerial roles and competencies*, Doctoral thesis, IIT Kanpur, 2002.

Sue Abdinnour-Helm, Mark L. Lengnick-Hall and Cynthia A. Lengnick-Hall. *Pre-implementation attitudes and organizational readiness for implementing an Enterprise Resource Planning system*. European Journal of Operational Research, Volume 146, Issue 2 , 16 April 2003, Pages 258-273.

Upton David M. *What really makes factories flexible*. HBR, July-August, 1995, pp 74-84.

Wilson Fiona M. *The view from above : Managers – What they Do and How their work is Described*. Organizational Behaviour, 1999

Appendix 1

Questionnaire

Name of Company :

Name (Optional) :

Designation (Optional) :

The management level you belong to: **Senior / Middle / Junior**

Name of department you work in :

Power

Instructions for rating :

(Give 1 for Not at all , 2 for Little bit , 3 for Substantial , 4 for Quite a lot)

	Before ERP	After ERP
1) Computer professionals/ person who are expert in software operations wield lot of power.	<input type="text"/>	<input type="text"/>
2) Management has a tight grip over the company.	<input type="text"/>	<input type="text"/>
3) Management encourages participation of all (in general) in the company.	<input type="text"/>	<input type="text"/>
4) Managers have control over their subordinates.	<input type="text"/>	<input type="text"/>
5) Management follows "authoritative" style of management.	<input type="text"/>	<input type="text"/>
6) Management consults everyone concerned before taking a decision.	<input type="text"/>	<input type="text"/>

People Skills

Instructions for rating :

(Give 1 for Not at all , 2 for Little bit , 3 for Substantial , 4 for Quite a lot)

	Before ERP	After ERP
1) Maintaining informal friendships/relations in company is important to discharge official duties.	<input type="text"/>	<input type="text"/>

गुरुवात्सल का पीताय केलकर पुस्तकालय
भारतीय प्रौद्योगिकी संस्थान कानपुर
यथादि क्र० A...152168.....

Privileged Information

Instructions for rating :

(Give 1 for Not at all , 2 for Little bit , 3 for Substantial , 4 for Quite a lot)

Before ERP	After ERP
---------------	--------------

- 1) How much privileged information is available with you that you do not easily share with others, either superior or subordinate.

<input type="text"/>	<input type="text"/>
----------------------	----------------------

Delegation

Instructions for rating :

(Give 1 for Not at all , 2 for Little bit , 3 for Substantial , 4 for Quite a lot)

Before ERP	After ERP
---------------	--------------

- 1) How will you describe level of delegation in your job?

<input type="text"/>	<input type="text"/>
----------------------	----------------------

- 2) How many routine tasks are delegated in your job?

<input type="text"/>	<input type="text"/>
----------------------	----------------------

- 3) How many decision making tasks are delegated for you?

<input type="text"/>	<input type="text"/>
----------------------	----------------------

Flexibility

- 1) How much flexibility the organization had in terms of ability to quickly implement new procedure/plans/process etc. ?

<input type="text"/>	<input type="text"/>
----------------------	----------------------

Scale on Autonomy

Instructions for rating :

(Give 1 for Not at all , 2 for Little bit , 3 for Substantial , 4 for Quite a lot)

	Before ERP	After ERP
1) How things are done are pretty much left to the people doing the work.	<input type="text"/>	<input type="text"/>
2) A person can make his decision without consulting any one else.	<input type="text"/>	<input type="text"/>
3) Most people here make their own rules.	<input type="text"/>	<input type="text"/>
4) I have a lot of say in what happens in my job.	<input type="text"/>	<input type="text"/>
5) I have enough authority to make a lot of decision in my work.	<input type="text"/>	<input type="text"/>
6) My job allows me to take a lot of decisions on my own.	<input type="text"/>	<input type="text"/>
7) I have enough freedom as to how I do my work.	<input type="text"/>	<input type="text"/>
8) To what extent you are able to act independently of your supervisor in programming your job function.	<input type="text"/>	<input type="text"/>
9) The control I have over the pace of my work.	<input type="text"/>	<input type="text"/>
10) The opportunity of independent thought and action.	<input type="text"/>	<input type="text"/>
11) How often you are able to choose the methods to do your work.	<input type="text"/>	<input type="text"/>
12) How frequently you choose order of things you do in your work.	<input type="text"/>	<input type="text"/>

Current and Past Status of Organization Structure:

STANDARDIZATION:

Instructions for rating :

For the following questions give rating between 1 to 7 representing appropriate level in your organization.

Before
ERP

After
ERP

1) Standard procedures are available in organization to be applied to management/administrative processes.

(1-Each case is unique, 2-Few procedures are available, 3-Some standard procedures are applied, 5-Lot of routinisation, 7-All problems have standard solutions)

SPECIALIZATION :

Instructions for rating :

For the following questions give rating representing appropriate level in your organization.

Before
ERP

After
ERP

1) Approximately what percentage of suppliers are specialized by the product or materil in your organization :

(1-Low , 2- High)

2) To what extent is costing specialized by product or factory in your organization :

(1- Less Extent , 2- Very high extent)

3) To what extent specialists hired in your organization :

(1- Few , 2- To a great extent)

CENTRALIZATION :

Instructions for rating :

Give rating at what levels the decisions asked in question are taken in your organization.

1	Operating	e.g. Direct Worker
2	Supervisory	e.g. Foreman
3	Work Flow Unit	e.g. Plant Manager
4	All work flow activities	e.g. Production Manager
5	Whole Organization	e.g. Managing Director
6	Above Chief Executives	e.g. Board of group

Before
ERP

After
ERP

1) Labour force requirements, their appointments, promotions :

2) Supervisory force requirements, their appointments, promotions :

3) Identification and decision on procurement of new machinery:

4) Identification and decision on new Products :

5) Decision on Production plans.

6) Welfare facilities to be provided :

7) Prices of output :

FORMALISATION :

Instructions for rating :

For the following questions give rating representing appropriate level in your organization.

Before
ERP

After
ERP

1) To what extent are written instructions available to workers in your organization :

(1 – Rarely available , 7 – Always available)

2) To what extent are written policies used in your organization :

(1 – Rarely available , 7 – Always available)

3) To what extent are written terms of reference or job descriptions available in your organization :

(1 – Rarely available , 7 – Always available)

4) Do you have recording of minutes for senior executive meeting :

(1 – Rarely , 7 – Always)

COMPLEXITY OF WORKFLOW:

Instructions for rating:

Please indicate the extent to which your organization employ each statement by writing an appropriate number as indicated:

Before
ERP

After
ERP

1) In your organization how frequently are interdepartmental committee set up to allow departments (manufacturing) to engage in joint decision making:

(1 – Rarely used , 7 – Used very frequently)

2) In your organization how frequently are task forces, temporary bodies set up facilitate interdepartmental collaboration on a specific project :

(1 – Rarely used , 7 – Used very frequently)

3) In your organization is there use of liaison personnel whose specific job is to coordinate the efforts of several departments for the purpose of a specific project :

(1 – Rarely used , 7 – Used very frequently)

4) In your organization what is the inter departmental interactions on most decisions:

(1 – Each department makes its decision on its own , 7 – High inter departmental interactions must)

Implementation Work and Strategy formulation work of a manager

Instructions for rating:

Please fill in the boxes the required data for first two questions, and tick the appropriate option for other questions

Before ERP

After ERP

- 1) Average percentage of time you spend in implementation work (chasing people, data acquisition etc.)
- 2) Average percentage of time spent on planning activities or strategy formulation, giving guidance to sub-ordinates etc.

--

--

--

--

For Question No. 3 to 7 please tick the selected option.

- 3) Has ERP led to better co-ordination in terms of accessing information, resources, people etc?
1- To a large certain, 2- to some extent, 3- very less
- 4) Has ERP led to better information integration?
1- To a large certain, 2- to some extent, 3- very less
- 5) Has ERP changed the ways you used to do work?
1- To a large certain, 2- to some extent, 3- very less
- 6) Has it resulted in impact on the culture and goal setting in your organization?
1- To a large certain, 2- to some extent, 3- very less
- 7) Has it changed the ways you serve your customers?
1- To a large certain, 2- to some extent, 3- very less
- 8) Decrease in order to ship time after ERP implementation
(In terms of percentage)

Appendix 2

Raw Data

Respondent No.		1		2		3		4		5		6		7	
Mgmt level		Senior		Senoir		Middle		Middle		Middle		Middle		Middle	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	2	2	2	3	2	2	3	2	3	2	3	2	2	3
	2	2	4	2	3	2	3	3	3	4	4	3	3	2	3
	3	2	4	3	3	2	3	2	2	4	4	3	3	3	3
	4	2	3	3	4	2	2	3	3	4	4	3	3	3	3
	5	2	3	3	2	2	2	2	2	2	2	1	1	4	3
	6	2	2	2	3	2	2	3	3	4	4	3	2	3	4
PEOPLE SKILLS	1	2	3	4	3	3	2	3	3	3	3	3	3	3	2
PRIV INFO	1	2	2	3	3	2	2	1	1	1	1	2	3	3	3
DELEGATION	1	3	3	3	4	2	3	3	3	3	3	2	3	3	4
	2	4	4	3	4	2	2	3	4	3	3	2	3	4	4
	3	4	4	3	4	2	3	2	2	3	3	2	3	3	3
FLEXIBILITY	1	2	4	2	3	3	2	3	3	4	4	2	3	2	3
AUTONOMY	1	3	3	2	3	2	2	2	2	3	3			3	2
	2	1	1	2	3	2	1	1	1	2	2			1	1
	3	2	2	2	2	2	1	1	1	1	1			1	1
	4	3	3	3	3	2	2	1	1	2	3			3	3
	5	4	4	3	3	2	2	2	2	2	3			3	4
	6	4	4	3	3	2	2	3	3	2	3			3	4
	7	4	4	3	3	2	3	3	3	3	3			3	3
	8	4	4	2	2	3	3	3	3	2	3			3	3
	9	4	4	2	3	3	2	4	4	2	3			2	3
	10	4	4	2	2	3	2	3	3	2	3			3	2
	11	3	3	3	3	3	2	3	3	3	3			3	3
	12	3	3	3	3	3	3	3	3	2	3			3	4
STANDARDIZATION	3	2	6	4	6	5	5	3	3	4	5			5	6
SPECIALIZATION	1	2	2	2	2			2	2	2	2	2	2	1	1
	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
	3	2	2	1	2	1	2	2	2	2	2	2	2	2	2
CENTRALIZATION	1	4	3	4	3	3	3	3	4	3	4			3	3
	2	4	4	4	3	3	3	3	4	3	4			3	3
	3	4	4	4	3	4	4	4	5	4	4			4	4
	4	6	6	5	5	5	5	4	4	5	5			3	3
	5	4	3	3	3	4	4	4	4	4	5			4	4
	6	5	5	5	5	5	5	4	5	5	5			3	3
	7	6	6	5	5	5	5	5	5	5	6			4	4
FORMALIZATION	1	3	6	3	6			7	7	3	3			7	7
	2	6	6	6	6			7	7	3	4	4	5	7	7
	3	4	5	4	6			5	5	3	5	4	4	7	7
COMPLEXITY	1	4	5	6	6	4	4	4	4	4	7	3	4	7	7
	2	4	6	6	6	3	4	5	5	6	6	3	4	7	7
	3	6	6	5	5	2	3	4	4			3	4	7	7
	4	5	5	6	6	4	5	4	4	6	6	3	4	7	7
IWSFW	1	5	5	20	10	15	15	25	50	60	40			40	20
	2	95	95	80	90	20	20	25	50	40	60			60	60
	3	1		1		1		3		1		1		1	
	4	1		1		1		3		1		1		1	
	5	2		1		1		3		1		2		1	
	6	2		1		2				1		1		1	
	7	2		1		1		3		1		1		1	
	8	20		30								30		70	

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respodent No.		8		9		10		11		12		13		14	
Mgmt level		Middle		Middle		Middle		Middle		Junior		Junior		Junior	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	1	2	2	2	2	3	2	3	2	2	2	3	3	4
	2	1	2	2	4	2	3	2	3	2	3	3	4	3	4
	3	2	2	2	2	3	3	2	3	2	4	2	2	3	3
	4	2	3	3	3	3	3	2	2	2	3	3	3	4	4
	5	2	4	2	3	3	3	2	2	2	3	3	3	3	4
	6	1	2	3	3	3	4	3	3	2	2	2	2	4	4
PEOPLE SKILLS	1	1	2	2	3	2	2	3	2			4	3	3	3
PRIV INFO	1	2	3	1	2	2	2	2	2	2	3	2	3	1	1
DELEGATION	1	3	3	2	3	2	3	2	4	2	2	3	3	2	3
	2	3	3	2	3	2	3	2	3	2	2	3	3	2	3
	3	3	3	3	1	2	3	2	2	2	2	2	3	2	2
FLEXIBILITY	1	2	3	1	2	2	3	2	3	2	2	2	2	3	4
AUTONOMY	1	2	2	3	2	2	2	3	3	2	3	3	2	2	2
	2	2	2	2	3	2	1	2	3	2	2	1	1	2	3
	3	2	3	2	1	2	1	1	1	2	3	3	2	1	1
	4	2	3	2	3	2	2	1	1	2	3	2	2	2	2
	5	3	3	2	3	2	2	1	2	2	2	2	2	2	2
	6	3	3	3	3	2	2	1	2	2	2	2	3	2	2
	7	3	4	2	3	2	3	2	2	2	2	3	2	2	2
	8	2	3	2	4	2	3	2	2	2	3	3	2	2	3
	9	2	3	3	4	2	3	2	2	2	3	3	2	3	3
	10	2	2	2	3	2	3	2	2	2	2	3	2	2	3
	11	2	3	2	3	2	3	2	2	2	2	3	2	2	2
	12	2	3	2	2	2	3	2	2	2	3	3	3	3	3
STANDARDIZATION	3	5	5	3	4	3	7	5	5	2	3	3	5	3	5
SPECIALIZATION	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2
	2	1	2	2	2	1	2	1	2	2	2	2	2	2	2
	3	1	1	1	2	1	2	2	2	2	2	2	1	2	2
CENTRALIZATION	1	4	4	3	5	3	3	4	4	3	3	3	3	4	4
	2	4	4	3	5	3	3	4	4	4	4	4	4	5	5
	3	4	4	4	5	5	5	4	4	5	5	3	3	5	5
	4	5	5	5	6	6	6	5	5	6	6	5	5	6	6
	5	4	4	3	4	5	5	4	4	4	4	3	3	4	4
	6	5	5	4	5	5	5	5	5	5	5	4	4	5	5
	7	6	6	5	6	5	5	4	4	5	5	4	4	6	6
FORMALIZATION	1	5	6	7	7	6	6	7	7	6	6	4	6	5	6
	2	6	6	7	7	6	6	7	7	6	6	4	6	5	6
	3	5	6	7	7	6	6	5	6	4	4	4	5	6	6
COMPLEXITY	1			7	7	5	6	6	6	3	4	3	5	5	5
	2			7	7	5	6	6	6	4	4	3	6	5	6
	3			1	7	6	7	5	5	4	4	5	5		
	4			7	7	6	7	5	5	4	4	5	5	5	5
IWSFW	1					40	5	40	40	50	35	40	10	50	40
	2					30	20	20	30	30	50	60	90	50	60
	3			1		1		2		2		1		2	
	4			2		1		1		2		1		2	
	5			1		1		2		3		1		1	
	6			1		2		1		3		1		2	
	7			1		1		2		2		2		2	
	8			50				0		20					

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respodent No.		15		16		17		18	
Mgmt level		Junior		Junior		Junior		Junior	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	2	3	2	3	2	3	4	3
	2	4	4	3	4	3	4	4	4
	3	2	2	2	2	2	3	1	3
	4	3	3	3	3	3	3	2	2
	5	3	3	2	2	3	3	4	3
	6	1	1	3	3	3	3	2	2
PEOPLE SKILLS	1	4	4	2	2	3	3	4	1
PRIV INFO	1	2	2	3	2	2	2	2	4
DELEGATION	1	1	1	2	2	2	2	4	2
	2	2	2	3	3	2	2	4	2
	3	1	1	2	2	2	2	1	1
FLEXIBILITY	1	2	2	2	2	2	3	2	2
AUTONOMY	1	2	2	2	2	2	2	3	3
	2	2	2	2	2	2	2	1	2
	3	1	1	2	1	2	2	4	3
	4	2	2	2	2	2	2	2	2
	5	1	1	2	3	2	2	1	1
	6	1	1	2	2	2	2	1	1
	7	3	3	2	2	2	2	1	1
	8	3	3	2	3	3	3	2	2
	9	3	3	2	3	3	3	2	2
	10	2	2	2	2	2	2	2	2
	11	3	3	2	3	2	2	2	2
	12	3	3	2	2	3	3	2	2
STANDARDIZATION	3	3	3	2	5	3	5	1	2
SPECIALIZATION	1	2	2	1	2	2	2	2	2
	2	2	2	1	2	2	2	1	1
	3	1	1			2	2	1	1
CENTRALIZATION	1	4	4	3	3	4	4	3	3
	2	4	4	5	5	4	4	4	4
	3	6	6	5	5	4	4	3	3
	4	6	6	5	5	4	4	4	3
	5	5	5	4	4	5	5	4	4
	6	5	5	6	6	5	5	5	5
	7	6	6	6	6	5	5	5	5
FORMALIZATION	1	3	3	4	5	3	6	4	5
	2	5	5	5	6	3	6	6	7
	3	2	2	4	4	4	6	2	3
COMPLEXITY	1	2	2	3	4	5	5	4	4
	2	5	5	4	6	5	5	4	4
	3	3	3	4	4	3	3	5	5
	4	2	2	5	5	6	6	2	4
IWSFW	1					30	20	90	70
	2					70	80	85	60
	3	2		1		1		1	
	4	3		2		1		1	
	5	2		2		1		1	
	6	3		2		1		3	
	7	2		3		1		2	
	8							50	

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respondent No.		1		2		3		4		5		6		7	
Mgmt level		Senoir		Senior		Senior		Senior		Senior		Senior		Senior	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	2	4	1	2	2	4	2	3	2	3	2	3	2	3
	2	2	3	2	4	2	3	3	4	3	3	2	4	2	4
	3	2	3	3	3	2	3	2	4	2	3	1	4	2	3
	4	2	4	1	3	2	3	3	4	2	4	2	2	2	3
	5	2	2	2	2	1	1	3	4	1	1	1	1	1	1
	6	3	3	1	3	3	4	4	4	2	2	3	3	2	4
PEOPLE SKILLS	1	2	2	2	2	4	4	3	3	3	3	3	4	3	3
PRIV INFO	1	2	3	2	3	1	1	2	3	2	3	1	1	3	3
DELEGATION	1	3	3	2	3	3	4	3	4	2	4	4	4	4	4
	2	3	4	2	4	3	3	2	3	3	2	1	1	4	4
	3	3	4	2	3	3	3	2	4	2	3	4	4	4	4
FLEXIBILITY	1	3	3	2	4	2	4	2	4	1	3	2	4	2	4
AUTONOMY	1	2	3			3	2	3	3	2	3	3	3	3	3
	2	2	2			3	2	2	3	1	3	2	3	2	2
	3	1	1			3	2	2	2	2	4	1	1	2	2
	4	3	4			3	4	2	1	2	3	3	4	3	3
	5	4	4			3	4	3	3	3	3	3	3	3	3
	6	4	4			3	4	3	3	2	3	3	3	3	3
	7	4	4			3	4	3	4	2	4	3	3	3	3
	8	3	3			3	4	2	3	2	3	3	3	3	3
	9	3	3			2	4	2	4	2	4	3	4	3	4
	10	3	3			2	4	3	4	2	3	4	4	3	3
	11	3	3			3	4	2	4	2	3	3	4	3	3
	12	3	3			3	4	2	3	2	3	2	4	3	3
STANDARDIZATION	3	3	5			4	5	5	5	3	5	1	6	2	4
SPECIALIZATION	1	2	2			2	2	2	2			1	1	2	2
	2	2	2			2	2	1	2					2	2
	3	1	1			2	2	1	2			2	2	2	2
CENTRALIZATION	1	4	3	4	3	4	3	4	4	3	3	5	2	4	3
	2	4	4	4	4	4	3	4	4	3	3	5	4	4	3
	3	4	4	4	4	5	4	4	4			5	4	4	4
	4	5	5	5	5	5	4	5	5			5	4	5	5
	5	4	4	4	4	4	3	4	4			5	3	4	3
	6	5	5	4	4	4	4	6	6	4	4	4	2	5	5
	7	5	5	5	5	5	5	6	6			5	5	5	5
FORMALIZATION	1	3	4	3	3	3	5	5	5	3	4	2	2	2	5
	2	6	6	6	6	7	7	6	6	7	7	5	5	6	6
	3	4	5	4	5	5	5	5	5	5	5	3	3	3	5
COMPLEXITY	1	5	5	6	6	5	5	6	6	5	5	7	7	6	6
	2	6	6	6	6	5	5	6	6	6	6	7	7	6	6
	3	1	1	2	2	1	1	2	2	1	1	7	7	3	3
	4	5	5	6	6	6	6	5	5	5	5	5	5	6	6
IWSFW	1	80	60	50	30	20	10			60	40				
	2	20	40	50	70	30	40	1		40	60				
	3	1		1		1		1		1		1		1	
	4	1		1		1		1		2		1		1	
	5	1		1		1		1		1		2		1	
	6	2		1		1		1		1		2		1	
	7	1		1		1		1		1		1		1	
	8			30		20		60				200		50	

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respondent No.		8		9		10		11		12		13		14	
/gmt level		Middle		Middle		Middle		Middle		Middle		Middle		Middle	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	2	4	2	3	2	3	4	2	1	1	2	3	3	3
	2	3	4	2	3	2	4	3	3	3	4	4	4	3	4
	3	2	3	2	4	1	3	4	4	4	4	4	4	3	4
	4	3	3	2	4	2	3	4	4	2	4	4	4	3	2
	5	2	2	2	3	2	3	2	2	2	2	1	1	3	2
	6	2	2	2	3	1	3	4	4	3	4			2	2
PEOPLE SKILLS	1	2	2	2	4	2	3	3	2	4	4	3	3	4	4
PRIV INFO	1	3	3	4	2	2	3	1	1	4	2	3	2	2	1
DELEGATION	1	3	3	3	2	1	2	2	2	4	2	3	3	2	3
	2	3	3	3	2	1	2	2	2	2	4	3	4	2	3
	3	3	3	3	2	1	1	2	2	2	3	3	3	2	2
LEXIBILITY	1	3	2	2	3	1	3	3	4	2	3	1	3	2	3
AUTONOMY	1	3	3	3	2	3	1	2	3	3	2			2	2
	2	2	3	2	4	1	3	1	3	3	2			2	2
	3	2	2	2	1	1	2	1	1	2	1			3	2
	4	4	4	3	2	3	2	3	3	2	4			2	3
	5	3	3	3	2	1	3	3	3	2	4			3	3
	6	4	4	3	1	1	3	3	3	2	4			3	3
	7	4	4	3	1	1	3	4	4	2	4			3	3
	8	3	3	2	3	4	2	4	4	2	3			3	3
	9	3	3	2	3	1	4	2	4	2	4			3	3
	10	3	3	2	3	1	3	2	4	3	3			3	3
	11	3	3	2	3	1	3	3	4	2	3			4	3
	12	3	3	2	3	3	2	4	4	3	4			3	3
STANDARDIZATION	3	4	5	3	5	2	5	2	3	5	7	2	3	3	5
SPECIALIZATION	1	2	2	1	2	1	2	2	2	1	2			1	2
	2	2	2	1	2	1	2	2	2	1	2			1	2
	3	2	2	2	1	1	2	2	2	1	2	1	1	1	2
CENTRALIZATION	1	3	3							3	3	3	3	3	3
	2	4	4							3	3	3	3	4	4
	3	4	4							4	4	5	5	4	4
	4	5	5							5	5	5	5	5	5
	5	4	4							3	3	4	3	3	3
	6	4	4							5	5	3	3	6	6
	7	5	5							5	5	6	6	6	6
FORMALIZATION	1	6	7							5	5	3	5	5	5
	2	6	6							5	5	6	6	5	5
	3	6	6							5	5	3	5	5	5
COMPLEXITY	1	3	3							4	4	5	6	6	6
	2	5	5							3	5	5	6	6	6
	3	5	5							2	2	3	2	2	2
	4	5	5							5	6	3	5	5	5
IWSFW	1	30	20	15	5	50	20	25	20	40	20	40	20	30	0
	2	20	30	25	35	20	60	10	15	30	40	30	40	50	70
	3	1		1		1		1		1		1		1	
	4	1		1		1		1		1		1		1	
	5	1		1		2		2		1		1		1	
	6	1		2		2		1		2		2		1	
	7	1		1		1		1		1		1		1	
	8	20				30		5		20		20		75	

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.
Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respondent No.		15		16		17		18		19		20		21		22	
Expert level		Middle		Middle		Junior		Junior		Junior		Junior		Junior		Junior	
	Q No	B	ERP	A	ERP	B	ERP	A	ERP	B	ERP	A	ERP	B	ERP	A	ERP
POWER	1	2	3	2	3	2	4	2	3	2	3	2	3	2	4	2	3
	2	3	4	1	3	3	3	3	3	3	4	3	4	2	4	2	4
	3	2	4	2	2	4	4	2	2	2	4	3	4	3	4	2	3
	4	3	4	2	2	3	3	3	3	3	4	2	3	2	3	2	2
	5	2	3	2	2	3	3	2	2	3	4	2	3	2	4	2	1
	6	4	4	1	2	3	3	2	2	4	4	2	2	3	4	3	3
PEOPLE SKILLS	1	3	3	4	2	1	1	3	3	3	3	4	4	3	2	3	2
ENV INFO	1	2	2	4	2	3	2	3	3	2	3	2	2			2	3
LEGATION	1	2	3	2	2	2	3	2	2	3	4	2	2	2	3	3	2
	2	2	3	2	3	2	2	3	2	2	3	2	2	2	4	3	2
	3	2	4	3	3	3	3	2	3	2	4	2	2	2	2	3	3
EXIBILITY	1	2	3	1	4	2	3	2	2	2	4	2	3	2	4	1	3
TONOMY	1	3	2	3	2	2	1	2	2	3	3	2	3	2	3	1	3
	2	2	2	2	3	2	2	3	2	2	3	2	2	2	3	2	4
	3	2	2	3	2	1	1	2	1	2	2	3	2	2	2	2	1
	4	2	1	3	3	4	4	2	2	2	1	2	2	2	3	2	3
	5	3	3	3	3	3	3	3	2	3	3	2	3	2	4	1	3
	6	3	3	3	3	3	3	3	3	3	3	2	3	2	4	1	3
	7	3	3	2	2	2	3	2	2	3	4	2	3	2	3	1	3
	8	2	3	2	3	2	3	2	2	2	3	2	3	2	4	2	4
	9	2	4	3	3	4	4	3	2	2	4	2	3	2	4	1	3
	10	3	4	3	3	3	3	2	3	3	4	3	2	2	4	1	3
	11	2	4	3	3	2	3	2	2	2	4	3	2	2	3	2	3
	12	2	3	2	2	2	3	3	3	2	3	3	3	2	3	2	4
ANDARDIZATION	3	5	5	2	3	3	3	2	2	5	5	2	3	3	6	3	5
ECIALIZATION	1	2	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2
	2	1	2	1	1	2	2	1	1	2	2	2	2	2	2	2	2
	3	1	2	1	1	1	1	1	1	1	2	2	2	1	2	2	1
NTRALIZATION	1	4	3	3	3	3	3	3	3	3	3	4	4	4	3	4	4
	2	4	4	3	3	4	4	4	4	4	4	4	4	4	3	4	4
	3	4	4	5	5	5	5	5	5	4	4	5	5	5	4	5	5
	4	5	5	5	5	6	6	6	6	5	5	5	5	5	5	6	6
	5	3	3	3	3	3	3	3	3	4	4	3	3	3	3	3	3
	6	6	6	3	3	5	5	5	5	5	5	3	3	5	5	6	6
ORMALIZATION	1	5	5	1	1	3	5	4	5	5	5	5	5	4	5	3	6
	2	6	6	1	1	6	6	5	5	5	5	5	5	5	5	7	7
	3	5	5	1	1	3	5	3	6	5	6	2	4	4	6	6	6
OMPLEXITY	1	6	6	7	7	6	6	6	6	6	6	7	7	5	5	5	5
	2	6	6	7	7	5	6	6	6	6	6	7	7	4	6	5	6
	3	2	2	7	7	4	4	5	5	4	4	7	7	2	2	3	5
	4	5	5	1	1	4	5	4	4	6	6	1	1	5	6	4	6
SFW	1					75	60					20	10				
	2					20	40					60	50				
	3	1				1		2		1		1		1			
	4	1				1		2		1		1		1			
	5	1				2		2		1		1		1			
	6	1				2		2		1		1		1			
	7	1				1		1		1		1		1			
	8	75				15		10		65		30					

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large extent, 2 - to some extent, 3 - very less

Respondent No.		1		2		3		4		5		6		7	
Mgmt level		Senior		Senior		Senior		Middle		Middle		Middle		Middle	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	3	4	2	3	3	4	2	2	2	4	2	1	2	2
	2	3	4	3	4	3	4	3	4	2	2	2	3	2	4
	3	2	3	3	4	3	4	2	2	2	3	2	3	2	2
	4	3	3	3	4	3	3	3	4	2	4	1	2	2	3
	5	3	2	3	4	3	3	2	2	1	3	1	1	2	2
	6	2	2	2	2	4	4	2	2	2	2	1	1	2	2
PEOPLE SKILLS	1	4	4	2	2	3	3	3	2	2	3	1	4	2	2
PRIV INFO	1	2	3	2	2	3	3	2	2	2	3	2	2	3	3
DELEGATION	1	2	3	4	4	3	4	3	4	2	3	2	2	3	3
	2	2	4	3	4	3	3	3	4	3	3	3	4	3	3
	3	2	3	3	4	4	4	4	3	2	2	2	3	3	3
FLEXIBILITY	1	2	4	3	4	3	3	2	3	2	2	2	4	2	3
AUTONOMY	1	4	2	2	2	3	4	3	2	2	2	2	3	3	3
	2	1	3	2	2	1	1	2	4	2	2	2	4	2	2
	3	1	4	2	1	1	1	2	2	1	1	1	1	2	2
	4	2	3	3	4	3	3	3	3	2	3	1	1	4	4
	5	2	4	3	4	3	3	3	3	3	3	2	4	4	4
	6	2	4	3	4	3	3	2	3	2	2	2	4	4	4
	7	2	4	3	4	3	3	3	4	2	2	2	4	4	4
	8	2	3	3	4	3	3	4	4	2	2	1	1	4	4
	9	2	4	3	4	3	4	3	3	2	3	2	4	4	4
	10	3	3	3	4	3	3	3	3	2	2	3	4	4	4
	11	4	2	3	4	3	3	3	3	2	2	3	3	4	4
	12	3	2	3	4	3	3	3	3	2	2	3	3	4	4
STANDARDIZATION	3	2	4	3	5	6	6	5	6	2	4	4	4	5	5
SPECIALIZATION	1	2	2	2	2	2	2	2	2	1	1	1	2	2	2
	2	2	2	2	2	2	2	1	2	1	1	1	2	1	1
	3	1.5	1.5	1	1	1	1	1	2	2	2	1	2	2	2
CENTRALIZATION	1	5	4	5	5	4	4	4	3	5	5	1	2	3	3
	2	5	5	5	5	4	4	5	4	5	5	1	1	6	6
	3	4	4	5	5	4	4	4	3	5	5			5	5
	4	4	4	5	5	5	5	6	5	5	5			6	6
	5	4	3	5	5	4	4	5	4	4	4			6	6
	6	3	3	4	4	4	4	5	5	5	5			6	6
	7	5	5	5	5	4	4	6	6	5	5			6	6
FORMALIZATION	1	4	6	5	6	4	4	3	6	3	4			4	4
	2	5	6	7	7	4	4	3	7	5	5			4	4
	3	6	6	4	5	5	5	3	5	2	4			4	4
COMPLEXITY	1	3	6	5	6	6	6	2	6	5	5			4	4
	2	4	6	1	2	6	6	2	6	5	5			5	5
	3	2	2	2	3	4	4	1	3	2	2			4	4
	4	2	5	3	5	7	7	2	6	2	2			4	4
IWSFW	1	60	20			20	10	40	20						
	2	20	50			80	90	10	30						
	3	1		1		1		1		2				1	
	4	1		1		1		1		1				1	
	5	1		1		1		2		2				2	
	6	2		2		1		2		3				2	
	7	2		2		1		2		3				2	
	8	40				5		15		20				30	

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respondent No.		8		9		10		11		12		13		14	
Mgmt level		Middle		Middle		Middle		Middle		Middle		Middle		Middle	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	4	3	4	1	2	3	2	3	2	1	2	3	2	2
	2	3	3	1	4	2	4	2	4	2	4	2	3	2	3
	3	2	3	2	3	3	3	2	3	2	3	3	3	3	4
	4	3	3	2	4	2	3	2	3	2	4	2	3	4	3
	5	3	3	1	1	2	3	2	4	1	3	3	3	2	2
	6	4	2	2	3	2	1	2	2	2	2	1	3	3	2
PEOPLE SKILLS	1	3	3	1	1	2	2	3	1	3	3	3	3	4	3
PRIV INFO	1	2	3	2	2	2	3	2	2	1	4	3	2	2	2
DELEGATION	1	2	3	2	4	1	3	2	3	2	2	2	3	2	3
	2	3	2	2	2	3	3	2	3	2	2	2	3	4	2
	3	2	3	2	3	2	3	2	2	2	3	2	3	2	3
FLEXIBILITY	1	3	4	4	2	2	2	2	2	3	2	2	3	2	4
AUTONOMY	1	3	2			2	3	2	2	2	2	2	3	3	2
	2	2	3	3	1	2	3	2	2	2	3	2	2	2	3
	3	3	2	3	1	2	1	1	1	3	2	4	2	2	2
	4	2	3	3	1	2	1	2	3	2	2	2	2	4	2
	5	2	3	3	2	2	2	2	3	2	2	2	2	4	2
	6	2	3	2	3	2	1	2	3	3	2	3	3	3	2
	7	2	3	2	2	2	1	2	2	2	3	3	3	3	2
	8	2	3			1	1	2	2	3	3	2	2	4	4
	9	2	3	1	4	1	3	2	2	2	3	2	3	3	2
	10	3	3	1	4	2	2	3	3	3	2	3	3	3	2
	11	2	2	4	1	2	2	2	2	3	2	2	3	2	2
	12	2	2	2	2	1	1	1	1	2	2	2	3	2	2
STANDARDIZATION	3	2	5	1	5	3	5	3	5	3	5	3	5	3	5
SPECIALIZATION	1	1	2	1	2	1	2	1	1	2	2	1	2	1	2
	2	1	2	1	2	1	2	2	2	1	1	1.5	1.5	1	2
	3	1	2	1	2	1	2	1	1			1	1.2	1	2
CENTRALIZATION	1	4	4	4	4	4	4	5	5	4	4	3	3	4	4
	2	4	4	4	4	5	5	5	5	4	4	4	4	4	4
	3	3	3	4	4	5	5	6	6	4	4	4	4	3	3
	4	4	3	5	5	5	5	6	6	5	5	5	5	4	3
	5	4	4	5	5	6	6	5	5	5	5	6	6	4	4
	6	5	4	5	5	6	6	5	5	5	5	6	6	4	4
	7	6	6	6	6	6	6	5	5	6	6	6	6	6	6
FORMALIZATION	1	3	5	1	7	5	5	3	7	1	1	3	5	3	5
	2	3	6	1	7	6	6	3	7	1	1	4	5	3	6
	3	4	6	1	7	5	5	3	7	1	1	2	4	3	6
COMPLEXITY	1	3	5			3	5	5	7			4	4	5	5
	2	2	6			2	6	5	7	4	4	4	4	5	5
	3	2	1			3	5	1	1			4	4	2	4
	4	4	4			3	4	5	7	2	6	2	5	2	4
IWSFW	1	30	20	70	30	70	60					70	50	5	10
	2	20	10	30	70	25	20					20	30	95	90
	3	1		1		1		1		1		2		1	
	4	1		1		1		1		1		1		1	
	5	2		1		1		2		2		1		1	
	6	2		1		1		2		2		2		1	
	7	1		1		2		2		2		1		1	
	8	30				20									

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.
Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respodent No.		15		16		17		18		19		20		21	
Mgmt level		Middle		Middle		Junior		Junior		Junior		Junior		Junior	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	3	2	2	2	3	3	2	2	2	3	3	3	1	1
	2	3	4	2	4	2	3	3	4	2	4	2	3	3	3
	3	2	4	4	4	2	2	2	2	3	4	2	3	4	4
	4	2	2	3	3	2	3	2	3	2	3	2	3	4	4
	5	3	2	2	2	3	2	1	1	1	3	2	3	1	1
	6	4	2	3	3	2	2	1	1	3	3	2	2	4	4
PEOPLE SKILLS	1	2	4	4	4	2	2	3	3	4	2	3	3	1	1
PRIV INFO	1	2	3	2	3	3	2	2	1	2	3	2	3	1	4
DELEGATION	1	2	2	3	3	2	3	2	2	2	3	3	3	4	1
	2	2	3	4	4	3	3	3	3	2	3	2	3	4	3
	3	1	2	3	3	2	3	3	3	3	2	3	3	4	3
FLEXIBILITY	1	3	3	4	4	3	4	2	3	2	3	2	3	4	3
AUTONOMY	1	3	2	3	3	4	3	2	2	4	2	2	3	4	4
	2	3	2	2	3	2	3	1	1	4	2	2	2	3	3
	3	1	1	2	2	4	2	2	2	3	1	2	2	1	1
	4	2	2	4	4	3	2	2	2	4	3	2	2	4	4
	5	2	3	4	4	2	3	2	3	4	3	3	3	4	4
	6	2	3	4	4	2	1	2	3	4	3	3	3	3	3
	7	2	3	4	4	3	3	2	2	4	3	3	3	3	3
	8	3	4	4	4	2	3	2	2	4	3	3	3	4	4
	9	3	4	4	4	3	2	2	3	2	3	2	3	4	4
	10	3	1	4	4	3	2	2	2	4	3	2	3	3	3
	11	3	1	4	4	3	2	2	2	3	1	2	3	3	3
	12	3	4	3	3	2	2	3	3	3	1	2	3	3	3
STANDARDIZATION	3	3	5	2	5	4	5	3	6	3	6	3	5	7	5
SPECIALIZATION	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2
	2	1	2	2	2	1	2	2	2	2	2	1	2	2	2
	3	2	1	2	2	2	2	2	2	2	2	1	1	2	2
CENTRALIZATION	1	4	3	4	3	4	4	3	3	3	3	5	5	4	3
	2	4	3	4	3	5	5	3	3	3	3	5	5	4	4
	3	5	4	5	5	3	3	4	4	5	4	4	3	4	3
	4	5	4	5	5	4	5	5	4	5	4	5	4	4	4
	5	5	4	4	4	5	5	4	3	4	4	3	3	4	3
	6	6	5	6	6	5	5	6	6	6	6	5	5	4	4
	7	6	6	6	6	5	6	6	6	6	6	5	5	5	5
FORMALIZATION	1	7	7	1	7	1	7	3	5	3	5	4	5	7	7
	2	7	7	7	7	7	7	5	5	5	6	4	6	7	7
	3	7	7	1	1	1	7	5	5	3	5	3	5	7	7
COMPLEXITY	1			1	7	1	7	5	5	5	5	3	5	7	7
	2			1	7	1	7	5	5	5	5	3	5	7	7
	3			1	7	1	7	2	2	1	1	3	4	7	7
	4			1	1	1	7	5	5	4	6	3	5	7	7
IWSFW	1	40	30	80	40			30	10	50	10	50	30		
	2	60	70	30	50			70	90	50	90	40	90		
	3	1		1		1		1		1		2		1	
	4	1		1		2		1		1		2		1	
	5	1		1		2		2		1		2		1	
	6	1		1		2		2		1		2		3	
	7	1		1		2		2		1		2		1	
	8	15		50				20				20			

Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Respondent No.		22		23		24		25		26		27		28	
Mgmt level		Junior		Junior		Junior		Junior		Junior		Junior		Junior	
	Q No	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP	B ERP	A ERP
POWER	1	3	2	2	3	1	2	2	3	3	3	2	3	2	3
	2	2	4	2	3	3	3	2	3	3	4	2	3	2	3
	3	2	3	2	3	4	4	2	3	3	4	3	2	2	3
	4	2	3	2	2	3	3	2	3	3	4	2	4	2	3
	5	3	1	2	3	2	2	2	3	3	3	2	4	1	1
	6	4	2	2	3	3	3	2	3	3	4	2	2	2	2
PEOPLE SKILLS	1	3	1	3	3	1	1	2	2	4	2	3	2	3	3
PRIV INFO	1	2	4	2	3	3	3	2	2	3	2	3	2	2	2
DELEGATION	1	2	4	2	2	3	3	3	2	3	4	3	2	2	2
	2	2	4	2	3	3	4	2	3	3	2	4	4	2	3
	3	2	4	2	2	4	4	2	3	4	3	3	3	1	2
FLEXIBILITY	1	2	3	3	3	3	4	2	3	2	4	2	3	2	3
AUTONOMY	1	2	3	2	3	3	3	2	3	3	4	2	3	2	3
	2	1	3	3	3	2	3	3	2	2	4	2	3	2	2
	3	4	2	2	3	2	2	3	2	3	1	3	2	2	1
	4	2	4	3	3	3	3	2	2	3	4	2	3	2	2
	5	2	3	2	2	4	4	2	3	3	4	2	2	2	2
	6	2	3	2	3	4	4	2	3	3	3	2	2	2	2
	7	2	3	3	3	3	3	2	3	3	3	3	3	2	2
	8	2	3	3	3	3	3	2	2	3	4	3	3	2	2
	9	2	3	2	3	3	4	2	3	2	4	3	3	3	3
	10	2	3	3	3	4	4	2	3	2	4	3	3	2	2
	11	2	4	3	3	4	4	3	2	3	4	3	3	2	2
	12	2	4	2	3	4	4	2	2	4	4	3	3	2	2
STANDARDIZATION	3	2	5	5	5	3	4	2	5	3	1	2	3	2	5
SPECIALIZATION	1	1	2	2	2					2	2				
	2	1	2	2	2										
	3	1	1	2	2					1	1				
CENTRALIZATION	1	4	2	3	3	4	4	3	3	4	4	2	2		
	2	4	3	4	4	5	5	4	4	3	3	2	2		
	3	5	3	4	4	5	5	4	3	5	5	3	3		
	4	5	3	4	4	4	4	4	4	5	5	3	3		
	5	4	3	4	3	3	3	4	3	3	3	3	3		
	6	4	3	4	4	4	4	5	5	3	3	3	3		
	7			5	5	3	3	5	5						
FORMALIZATION	1	1	6	4	6	6	7			4	5	7	7	3	6
	2	2	6	5	6	7	7			4	6	7	7	3	6
	3	2	5	5	6	4	4			3	4	7	7	4	6
COMPLEXITY	1	2	6	4	5	5	5			6	6	7	7	4	6
	2	2	6	4	4	6	6			6	6	7	7	4	6
	3	2	5	5	6	5	5			2	2	7	7		
	4	2	5	4	5	6	6			6	6	7	7	5	5
IWSFW	1	60	5	50	40	15	10	30	20	60	20			40	20
	2	40	5	50	60	90	90	70	80	20	60			60	80
	3	1		1		2		2		1		1		1	
	4	1		1		2		1		1		1		1	
	5	2		2		3		2		2		1		1	
	6	1		2		3		1		2		1		1	
	7	1		2		3		1		2		1		1	
	8	50				20		20		20				20	

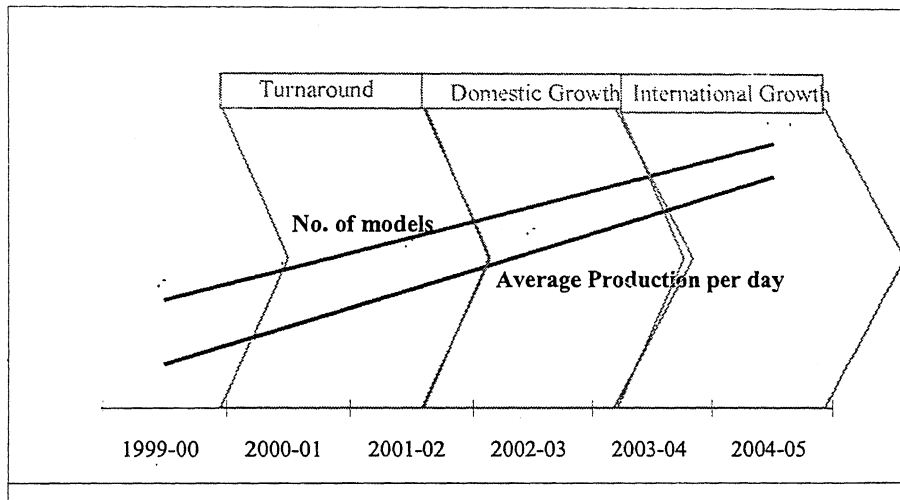
Note : In IWSFW Responses for ques 3 to 8 are given in A ERP column only as these questions are related to what extent is the effect of ERP on asked parameters.

Responses for ques 3 to 8 are coded as 1 - To a large certain, 2 - to some extent, 3 - very less

Appendix 3

Today the organization has 2000+ supplier base supplying 40000+ parts/ aggregates, design, manufacture and delivery of over 1,60,000 vehicles per year comprising over **130** active models and providing service to over 30 lakh vehicles with varying emission norms in different part of the country.

Following figure shows no. of models and variants are going up every year. The average production per day has more than doubled in last five years time. Also in the same time span almost each and every product line has undergone major improvements which have benefited the customer in big way, such as EX series in all segments, all versions of buses, MAVs, Sumo facelift, etc.



The organization has expanded in all sectors with product offerings spanning Medium and Heavy Commercial Vehicles (M&HCV), Light Commercial Vehicles (LCV), Multi-Utility Vehicles (MUV), ICV, MCV and LCV buses and Passenger Cars.

Structural changes in the CV industry

- New emerging segments adding complexity along with small volumes
- Lower overall margins and continuing cyclicalality
- Following the global path of evolution, but the need to catch up much faster

Customer and Market

- Discerning and well-informed customer profile
- Numerous players, resulting in a highly competitive market
- Greater movement of core products such as steel and cement